

**Upper Clark Fork River Basin Restoration Project Grant
Application**

Bonner Pedestrian Bridge Project



Photo – Milltown Conceptual Restoration Plan, Water Consulting Inc., 2003

Submitted by Missoula County

March 1, 2006

Table Of Contents

Applicant Information and Project Summary Form	Page 4
Proposal Abstract	Page 7
Technical Narrative	Page 8
Project Need/Problem Definition	Page 8
Past Efforts to Address Project Needs	Page 9
Project Goals and Objectives	Page 12
Alternatives Evaluated	Page 12
Natural Resource Benefits of the Project	Page 13
Secondary Benefits of Project	Page 14
Project Schedule	Page 16
Proposed Bridge Design	Page 17
Three Span Bridge Construction Procedure	Page 19
Streambank Revegetation	Page 20
Project Staff	Page 21
Contracted Services Required	Page 21
Qualifications of Project Team	Page 21
Required Permits and Approvals	Page 21
Project Cost, Grant Request and Match	Page 22
Environmental Impact Checklist and Narrative	Page 22
Criteria Statements	Page 28
Relationship of Expected Costs to Expected Benefits	Page 28
Cost Effectiveness	Page 30
No Action Alternative	Page 30
Description of Options For Retaining Existing Structure	Page 30
New Bridge Options	Page 31
Preferred Alternative	Page 32
Results of Superfund Actions	Page 37
Recovery Period and Potential for Natural Recovery	Page 37
Applicable Policies, Rules and Law	Page 38
Resources of Special Interest to Tribes and DOI	Page 38
Project Location	Page 38
Actual Restoration of Injured Resources	Page 40
Relation Between Service Loss and Service Restoration	Page 40
Public Support	Page 41
Public Access	Page 41
Matching funds and cost Sharing	Page 41
Ecosystem Considerations	Page 42
Coordination and Integration	Page 42
Normal Government Functions	Page 43
Proposal Budget	Page 43
Budget Narrative	Page 43
Letters of Support	Page 47

List of Tables, Figures and Photos

Tables

Table 1 Cost Comparison for All Approaches Considered Excluding Lighting and Revegetation Costs	Page 33
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Figures

Figure 1 Bonner Bridge Location	Page 8
Figure 2 Bonner Bridge Locations	Page 9
Figure 3 Bonner Bridge Cross-section	Page 10
Figure 4 Trail, Footbridge and River Access Improvements Associated with Bonner Bridge Project	Page 11
Figure 5 Cross Section Showing Existing Bridge, Existing Pier Locations, and New Pier Locations	Page 14
Figure 6 Milltown Area Redevelopment Conceptual Plan	Page 15
Figure 7 Construction Timeline for Three Span Bridge	Page 16
Figure 8 Overview of Design and Construction Activities	Page 17
Figure 9 Two Span Pre Fabricated Pedestrian Bridge	Page 34
Figure 10 Single Span Truss Bridge	Page 34
Figure 11 Plan view Of Blackfoot River Showing Three-Span Bonner Pedestrian Bridge And Highway 200 Bridge	Page 35
Figure 12 Plan View of Blackfoot River Showing All Bridges	Page 36
Figure 13 Cross Section of New Three Span Pedestrian Bridge	Page 36
Figure 14 Plan View of New Pedestrian Bridge showing distance of new and existing piers from embankments	Page 37
Figure 15 Bonner Bridge Location	Page 39
Figure 16 Bonner Bridge Location	Page 39

Photos

Photo 1 Roscoe Steel Pedestrian Bridge	Page 18
Photo 2 Roscoe Steel Pedestrian Bridge	Page 18
Photo 3 Roscoe Steel Pedestrian Bridge	Page 19
Photo 4 Bonner School Student Returning From School Across Bonner Bridge	Page 29

Step 1. Applicant Information and Project Summary Form

1. Name of Applicant(s) Missoula County
2. Project Title Bonner Pedestrian Bridge Replacement
3. Type of Entity* County
If the bridge is not replaced, it will become unstable for use following removal of the Milltown Dam.
4. Description of Project Location The Bonner Pedestrian Bridge is located over the Blackfoot River arm of the Milltown Reservoir, just upstream of the Milltown Dam. The bridge is within the Milltown Reservoir area, as defined in the Upper Clark Fork River Basin Restoration Plan Procedures and Criteria (RPPC), and within the BFR1 reach Restoration Project Area of the Restoration Plan for the Clark Fork River and Blackfoot River near Milltown Dam – October 2005 (State Restoration Plan).
5. Injured Natural Resource(s) and/or Impaired Services to be Restored, Rehabilitated, Replaced or Equivalent Acquired through Project. Removal of the existing pedestrian bridge and three concrete piers from the river bed will restore aquatic resources and riparian habitat. The current pedestrian bridge is a two span bridge with a concrete center pier in the middle of the river and will become unsafe once the Milltown Dam is removed. Two abandoned concrete piers remain in the river bed from a former three span bridge configuration at the site. The removal of the current bridge and all three concrete piers will allow restoration of a naturally functioning river channel as part of the restoration of the Clark Fork and Blackfoot Rivers following removal of the Milltown Dam. The existing bridge will be replaced with a three span pedestrian bridge with no piers constraining the river channel. Replacement of the bridge will maintain the baseline level of service to the local community. Two 30-inch drilled piers will be located at the bridge approach sections approximately 50-60 feet from the toe of the approach embankment, and about halfway up the predam embankment from the river, minimizing encroachment on the river at high flows. The new pedestrian bridge will link with planned pedestrian trails in West Riverside and Milltown and to the Bonner School in Bonner. The bridge will also coordinate and link with a new recreational trail and footbridge system as proposed by the Milltown Superfund Site Redevelopment Working

Group and Missoula County. The trail system will be built in the restored Milltown Reservoir area, extending downstream to the Kim Williams Riverfront Trail system in Missoula, and upstream to the Turah Fishing Access site on the Clark Fork River and to the Weigh Station Fishing Access Site on the Blackfoot River.

6. Authorized

Representative: Bill Carey Chairman, Missoula Board of County Commissioners
(Name) (Title)

Mailing Address: 200 W. Broadway
(Street/PO Box)
Missoula MT 59802 406-258-4877
(City/State/Zip) (Telephone)

Contact Person*: Peter Nielsen Environmental Health Supervisor
(Name) (Title)

Mailing Address*: 301 W. Alder
(Street/PO Box)
Missoula MT 59802 406-258-4968
(City/State/Zip) (Telephone)

E-mail Address: nielsenp@ho.missoula.mt.us

Funding Source		Amount in (\$) Dollars					Matching Fund Percentage (Funding Source Total/Project Total)
		Committed Funds			Uncommitted Funds	Total	
		Grants	Non-Grant Funds				
			Cash	In-kind			
A.	UCFRB Restoration Fund	\$ 975,652.00				\$ 975,652.00	75.00%
B.							
C.	EPA	\$ 250,000.00				\$ 250,000.00	19.22%
D.	Fed Transportation bill	\$ 75,218.00				\$ 75,218.00	5.78%
E.							
F.							
G.							
H.							
I.							
Non-NRDP Totals		\$ 1,300,870.00				\$ 325,218.00	25.00%

8. Estimated Total Project Cost \$1,300,870.00
(Automatically Calculated from spreadsheet above)

9. Private (non-Governmental) Grant Applicant Financial Information – not applicable

10. Certification for Individuals or Public Entities – not applicable

11. Authorizing Statement

An authorized agent/agents representing the applicant must by his/her signature indicate that the application for funds and expenditure of matching funds, as represented, is officially authorized.

Grant Authorization

I hereby declare that the information included in and all attachments to this application are true, complete, and accurate to the best of my knowledge, and that the proposed project complies with all applicable state, local, and federal laws and regulations.

I further declare that, for **Missoula County**, I am legally authorized to enter into a binding contract with the State of Montana to obtain funding if this application is approved. I understand that the Governor must authorize funding for this project.

Missoula County

Project Sponsor

Date

Authorized Representative (signature)

Title

Proposal Abstract

Applicant Name: Missoula County **Project Title:** Pedestrian Bridge Replacement

Project Description and Benefits to Restoration: Missoula County proposes to remove and replace a County-owned pedestrian bridge over the Blackfoot River arm of the Milltown Reservoir known as the Bonner Bridge. The project will restore aquatic and riparian habitat resources. Replacement of the existing bridge will maintain the baseline level of transportation services for the local community. The project will also replace lost recreational resources by linking to pedestrian and recreational trails planned by the Milltown Superfund Site Redevelopment Working Group in the restored confluence area, Milltown, West Riverside, upstream to the Turah and Weigh Station Fishing Access sites, and to Missoula's Kim Williams Riverfront Trail.

The Bonner Bridge is within the Milltown Reservoir area, as defined in the Upper Clark Fork River Basin Restoration Plan Procedures and Criteria (RPPC) and within the BFR1 reach of the of the State Restoration Plan for the Clark Fork River and Blackfoot River near Milltown Dam – October 2005. The Bonner Bridge was built in 1921, after the completion of the Milltown Dam in 1908. It served as a state highway bridge until 1977, when it was closed by the State of Montana and turned over to the County for long-term maintenance as a pedestrian bridge. It is a two-span bridge with a concrete center pier, two concrete piers in the river channel under the bridge, and two approach piers near each river bank..

When the Milltown Reservoir is drawn down by 29 feet in fall, 2008 as part of Superfund site remediation, the river bed elevation will drop and reservoir sediments will be scoured from the bed of the Blackfoot River channel of the reservoir. As this occurs, the Bonner Bridge piers and abutments will be stressed due to increased river velocity, and may be undermined as the river cuts down to its new bed elevation, resulting in the need to replace the bridge if it is to provide for safe pedestrian passage over the Blackfoot River.

Under the Milltown Reservoir Site Consent Decree, impacts to the Interstate 90 and Highway 200 bridges will be mitigated by the United States Environmental Protection Agency. Missoula County is responsible for costs associated with the Bonner Bridge. The County sought funds for replacing the bridge through the 2005 federal transportation bill. The bill included an appropriation of \$5 million for pedestrian trails, footbridges and river access site improvements at or near the Milltown Dam site in Missoula County and Deer Lodge County. Because these funds will be split between the two counties, Missoula County must seek other funding sources for the projects it proposed for federal funding. The County has prioritized the Bonner Bridge replacement and construction of pedestrian trails in residential neighborhoods that will be impacted by heavy equipment traffic during Superfund remediation and restoration. These projects must be completed prior to the fall 2007 drawdown.

Removal of the existing pedestrian bridge and three concrete piers from the restored river bed will restore aquatic resources and riparian habitat and allow restoration of a naturally functioning river channel as part of the restoration of the Clark Fork and Blackfoot Rivers following removal of the Milltown Dam. The existing bridge will be replaced with a three span pedestrian bridge with no piers constraining the river channel.

Total project cost is \$1,300,870. The County requests a grant of \$975,652 from the Natural Resource Damage Program, and will provide \$325,218 in matching funds (25 % match). Demolition of the existing bridge and construction of the new bridge would be completed prior to the third week of August, 2007 because the bridge is used by Bonner School (K-8) students who reside west of the Milltown Reservoir. Streambanks and the right-of-way disturbed by removal and installation of the bridges will be restored using plant species consistent with revegetation plans for the State Restoration Plan

TECHNICAL NARRATIVE

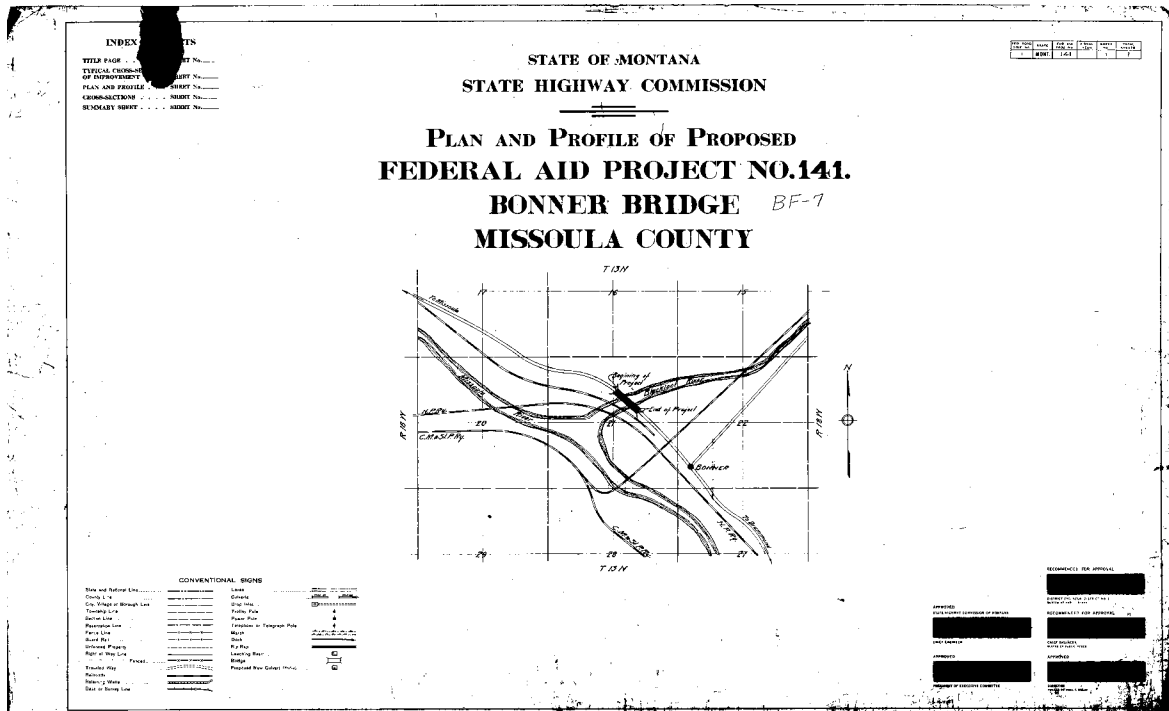
Applicant Name: Missoula County

Project Title: Bonner Pedestrian Bridge Replacement

PROJECT NEED/PROBLEM DEFINITION

Missoula County proposes to remove and replace a County-owned pedestrian bridge over the Blackfoot River arm of the Milltown Reservoir known as the Bonner Bridge. The project will restore aquatic and riparian habitat resources, and provide a safe link to pedestrian and recreational trails in the restored confluence area, Milltown and West Riverside.

The Bonner Bridge was built in 1921 within the Milltown Reservoir, replacing a bridge built at the same location in 1912. The bridge was built in the reservoir after the completion of the Milltown Dam in 1908. Its center piling and approach pilings were not extended to a depth sufficient to withstand the river forces that will occur following removal of the Milltown Dam. As a result, an unsafe condition will be created and the bridge must be repaired or replaced prior to the Stage 2 drawdown of Milltown Reservoir, which will reduce water level in the reservoir by approximately 17 feet and is scheduled to occur in the fall of 2007. The final Stage 3 reservoir drawdown is scheduled to occur in early 2008.



The Bonner Bridge served as a state highway bridge until 1977, when it was closed by the State of Montana and turned over to the County for long-term maintenance as a pedestrian bridge. It is a two-span bridge with a concrete center pier, two abandoned concrete piers in the river channel under the bridge, and two approach piers near each river bank.

When the Milltown Reservoir is drawn down a total of 29 feet in fall, 2008 as part of site remediation, the river bed elevation will drop approximately 10-12 feet at the location of the Bonner Bridge, reservoir sediments will be eroded downstream, and the Blackfoot River will become a river once again. As this occurs, the Bonner Bridge pilings and abutments will be stressed due to increased river velocity, and may be undermined as the river cuts down to its new bed elevation, creating potential safety threats to bridge users.

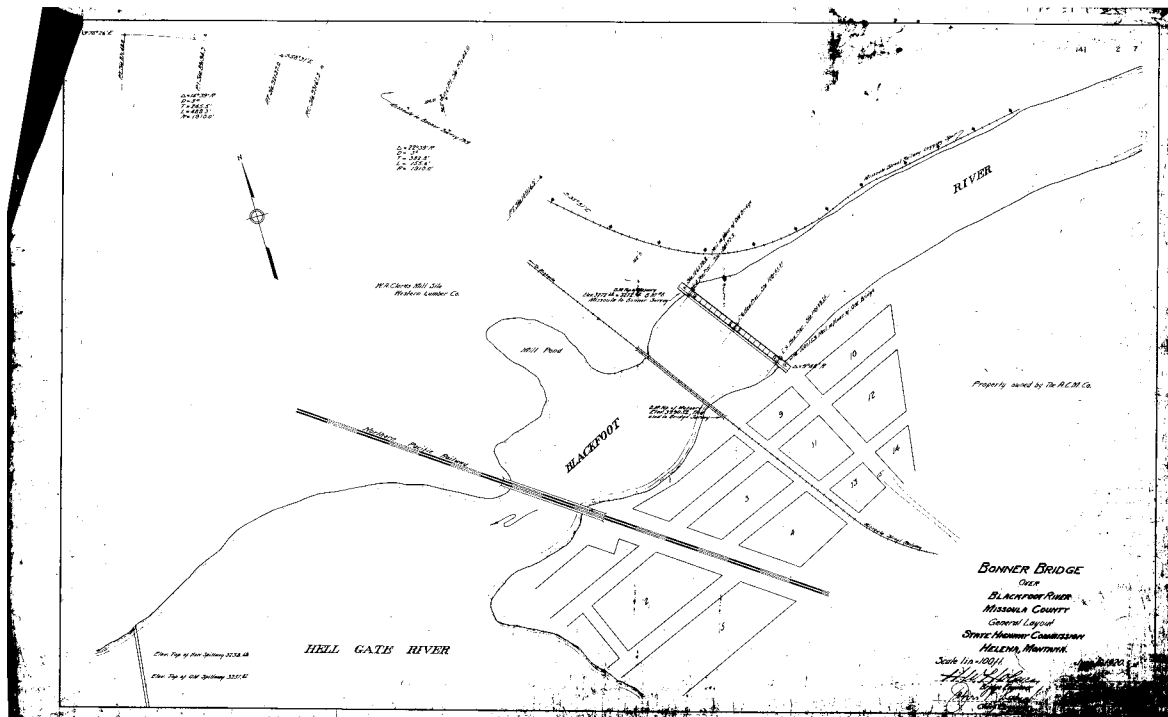


Figure 2 Bonner Bridge Location

There are five bridges over the Blackfoot River arm of the Milltown Reservoir that may be affected by removal of the Milltown Dam. These include the two Interstate 90 bridges, a Railroad bridge, Highway 200 bridge, and the Bonner Bridge, which is the farthest bridge upstream of the Milltown Dam. The Bonner Bridge was built with the shallowest piers of all of the five bridges. Under the Milltown Reservoir Site Consent Decree, impacts to the Interstate 90 and Highway 200 bridges will be mitigated by the United States Environmental Protection Agency. Montana Rail Link and Arco have reached an agreement on funding any necessary repairs to the railroad bridge. Missoula County is responsible for the Bonner Bridge.

Past Efforts to Address Project Needs

Missoula County had originally planned to rehabilitate or replace its pedestrian bridge using the existing center pier to support a two-span bridge. Based on site planning documents, the County assumed that the bed elevation of the Blackfoot River arm of the reservoir would be maintained through grade control structures designed to protect the Interstate and State Highway bridges. Missoula County was not a party to the Consent Decree negotiations for the Milltown in which responsibilities for the various bridges were established.

The initial budget established by the County for replacing the bridge was based on the understanding that the river bed elevation would be controlled at or near the most downstream Interstate 90 bridge, and that the piers for the Bonner Bridge would be protected by this river bed grade control. The County's appropriation request submitted to Montana's Congressional Delegation in February, 2005 included funds for replacement of the Bonner Bridge. In mid-2005 the County was informed by State and Federal agencies involved in the Consent Decree negotiations that it would be responsible for all necessary repairs to its bridge. The County also learned that technical evaluations of bridge stability had determined that river bed grade control would not be successful in protecting the Interstate and Highway 200 bridge pilings, and that other forms of protection would be required. The County received this information too late to adjust its budget request for federal appropriations. The impact of the new information regarding river bed grade control was that the Bonner Bridge's center pier and approach piers would not be protected against erosion following dam removal. In order to repair or replace the Bonner Bridge, new piers would have to be constructed in the river bed or a new bridge installed to span the river without piers. These alternatives increased the costs of mitigation for the Bonner Bridge significantly.

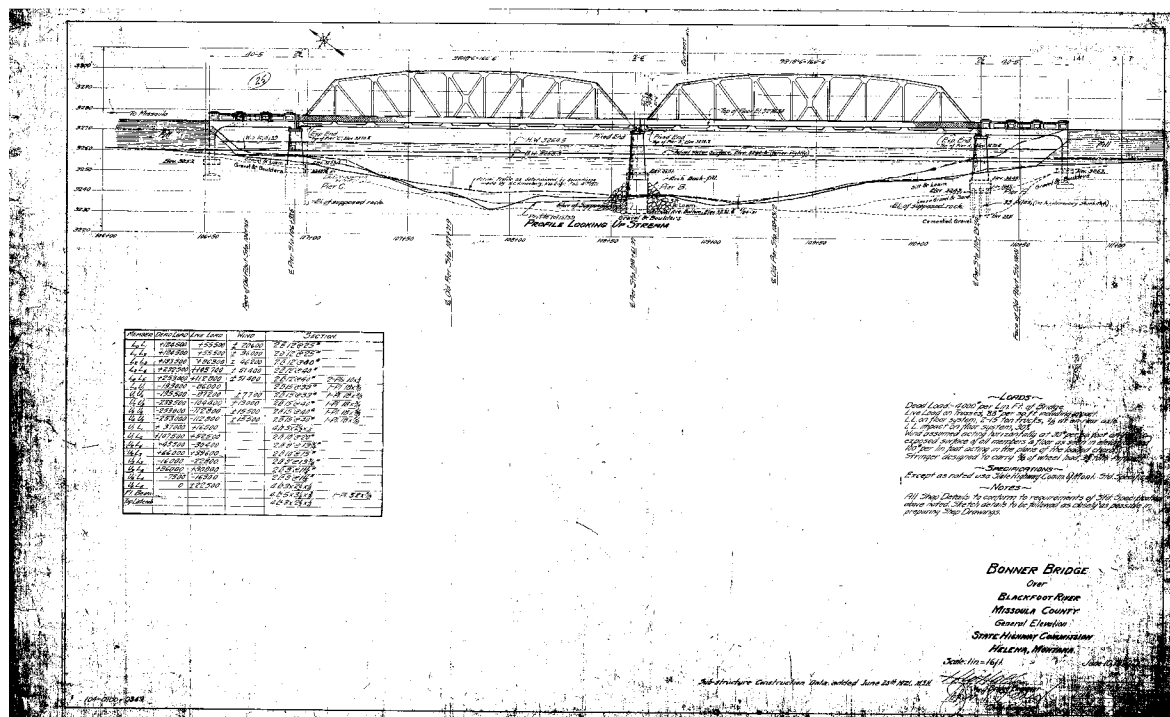


Figure 3 Bonner Bridge Cross Section

Montana Senator Max Baucus was successful in obtaining an appropriation of \$5 million for transportation projects related to the Milltown site in Missoula and Deer Lodge Counties. The Missoula County funds are to be used to for projects proposed by the Milltown Superfund Site Redevelopment Working Group, a broad-based citizens group appointed by the Missoula County Commissioners in 2003 to propose redevelopment plans for the Milltown site following cleanup and dam removal. Because these funds will be split between the two counties, Missoula County must seek other funding sources to complete the projects it proposed for federal funding.

The Redevelopment Working Group's plans for federal transportation bill funding included the replacement or repair of the Bonner Bridge, construction of a new pedestrian bridge downstream of the Milltown Dam over the Clark Fork River, construction of 21 miles of recreational and commuter trails, connection of the Kim Williams Trail to a trail currently being built on the perimeter of the Bandmann Flats golf course, and river access site improvements for the Weigh Station Fishing Access site on the Blackfoot River. Due to funding restrictions, the County has prioritized its plans for the Bonner Bridge replacement, and construction of pedestrian trails in residential neighborhoods that will be impacted by heavy equipment traffic during Superfund remediation and restoration activities. These County projects must be completed prior to the fall 2007 drawdown. Missoula County requests \$975,652 in funding from the Clark Fork River Restoration Fund to complete this work. Funding for the remaining trails, river access site improvements and the second bridge over the Clark Fork River below Milltown Dam will be sought from Federal, State, local and private funding sources, which may include the Upper Clark Fork Restoration Fund. Figure 4 below shows the location of work proposed in 2006-7, and projects to be completed at a later date when funding becomes available through other sources.

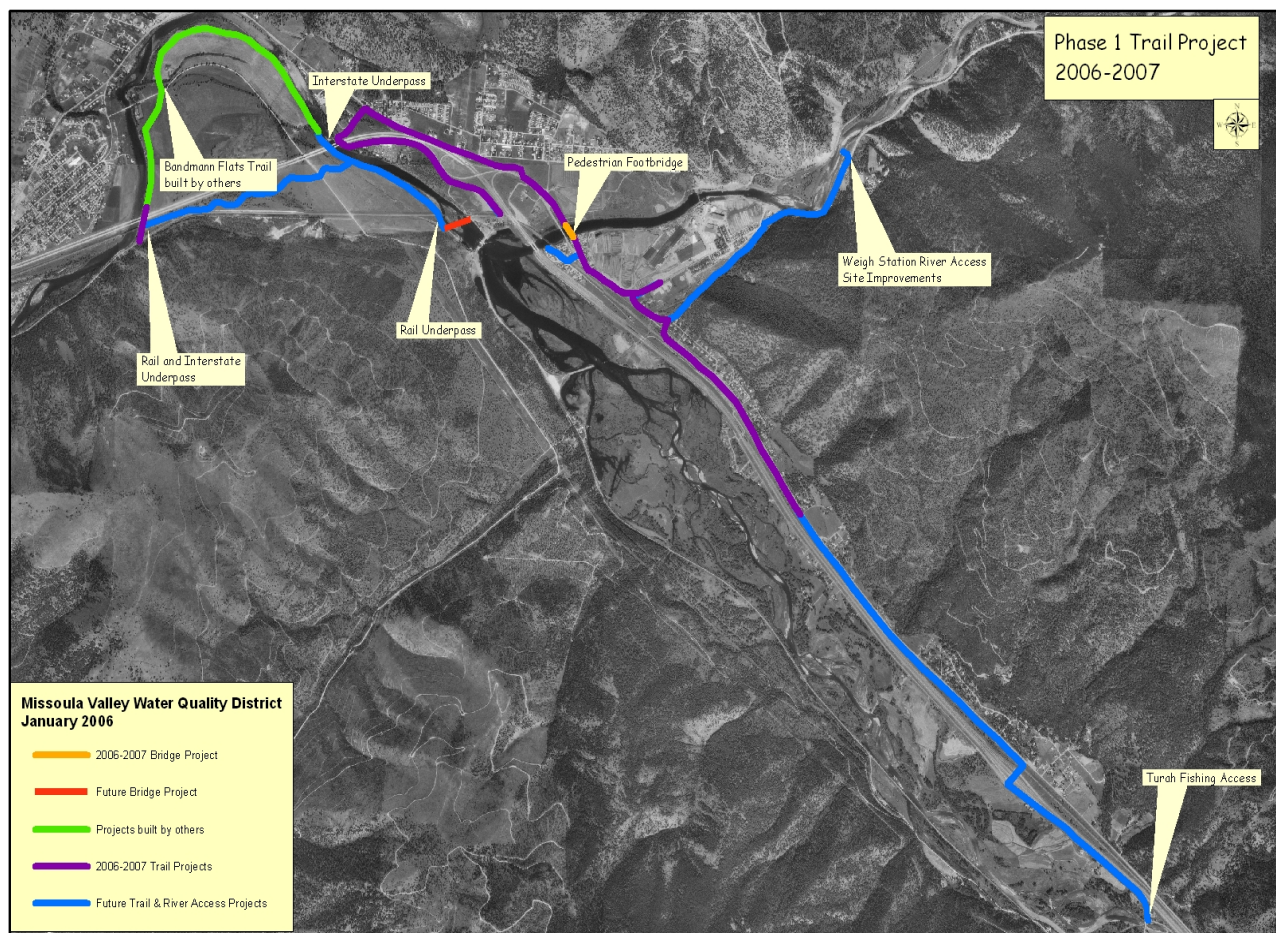


Figure 4 Trail, Footbridge and River Access Improvements Associated with Bonner Bridge Project

Project Goals and Objectives.

The Bonner Bridge Replacement Project will have the following goals:

1. Restoration of Aquatic resources through removal of the existing pedestrian bridge and three concrete piers from the river bed.
2. Replace the current bridge to maintain the baseline level of transportation service to the local community, with a new pedestrian bridge that will not constrict the river channel
3. Revegetate disturbed and non-disturbed areas within the County's 60 foot right of way, from the top to bottom of the pre-dam embankment. Revegetation will be consistent with and augment the State Restoration Plan for the Blackfoot River
4. Use durable and non-polluting materials for bridge construction to minimize need for long-term maintenance and potential for water pollution.
5. Substructure elements would be designed to provide minimum river flow restrictions and would not be affected adversely by riverbed scour. No future maintenance would be required for scour protection.
6. Provide connections to transportation and recreation trail projects in the local community, the restored confluence area, Bonner School, Kim Williams Riverfront Trail, and trails extending up the Blackfoot and Clark Fork Rivers.
7. Design and build the pedestrian bridge project in such a manner that it coordinates with and augments the goals and objectives of the State Restoration Plan, and the Superfund cleanup. This plan calls for the restored river channel to be approximately 175 feet in width at the location of the Bonner Bridge. If the center piers and abutment piers were left in place and fortified, the river would be significantly constrained. The total width of the Bonner Bridge is currently 400 feet. If the center pier and abutment piers were to remain in place, the restored river would either have to be engineered to remain in a channel on one side of the floodplain or constructed with a center pier within the river channel. These alternatives would conflict with the goals of the Draft Restoration Plan. Most importantly, the maintenance and fortification of the Bonner Bridge piers would conflict with the plan's Overall Project Goal, "Restore the confluence of the Blackfoot and Clark Fork Rivers to a naturally functioning, stable system." Maintaining the piers in place would also conflict with the Draft Restoration Plan's Goal number 3, "Provide high quality habitat for all native fishes and other trouts...", Goal number 4, "Provide functional wetlands and riparian communities..." and Goal number 6, "Provide safe recreational opportunities compatible with other restoration goals..."

Alternatives Evaluated

Missoula County hired a civil and structural engineer, Mr. Dennis Gathard of G & G Associates, to evaluate potential options to mitigate the impacts of sediment scour on the Bonner Bridge following removal of the Milltown and Stimson Dams. Two general concepts were investigated, repairing and stabilizing the existing bridge and removing and replacing the bridge. Rerouting pedestrian traffic to another location was also investigated. Approaches investigated include measures to protect the base of the piers against scour below the foundation or providing new support systems for the existing piers. Approaches that investigated stabilizing the existing structure also included measures for repairs for the existing structure. Several configurations for a new bridge were also investigated, including pre-fab truss, engineered truss, suspension and

cable stay bridge designs. A more detailed analysis of alternatives is included under the Cost Effectiveness criteria statement in this application.

The preferred alternative among the approaches described above is to demolish the existing through-truss bridge with all of its elements completely, remove the remnant piers of the bridge, and construct a new three span bridge in the current Bonner Bridge alignment. Because of the reduced center span of a three span bridge, this approach is significantly less expensive than a new single span bridge but still avoids the negative impacts to the river from piers located in the river flow that would result from upgrading the existing bridge or constructing a new two span bridge.

While the removal alternative has many advantages for natural resource restoration, it would be a significant change for the local community. If the bridge were not replaced, the only safe pedestrian passage from communities located on the west side of the reservoir to Milltown and Bonner would be eliminated. Of utmost concern to the local community, school children residing in West Riverside, Pinegrove and Marshall Grade to the west of the reservoir would have no safe pedestrian route to the Bonner (K-8) school. The Highway 200 bridge would be the only remaining route, and it is not constructed to contemporary standards for traffic lane width and pedestrian passage. As a result, it is not a safe, long-term option for pedestrian passage. For this reason, removal of the existing bridge without replacement with a new bridge is an unacceptable alternative. Because the existing bridge will be made unstable as a result of the removal of the Milltown Dam, removal of the bridge prior to reservoir drawdown and construction of a new three span bridge is the best option for maintaining service to the community and benefiting the river resource.

Some local residents have expressed concern about removal of the Bonner Bridge, due to its historic significance to the community. This concern was amplified for some people because it would occur at the same time that other community landmarks, the Milltown Dam and powerhouse, would also be removed within the next few years.

The Milltown Redevelopment Working Group evaluated alternatives for repairing or replacing the bridge during the summer and fall, 2005. Some members of the group were initially opposed to removing the existing bridge due to loss of an important historic landmark in the community, and requested that alternatives be closely examined to retain the existing bridge. The County's engineer provided information to the group on the feasibility and costs of replacement or repair alternatives. Ultimately, the group came to a consensus recommendation to the Commissioners that the bridge be replaced with a truss construction pedestrian bridge that would not require piers in the river. After much discussion the group decided that the loss of the existing bridge was unfortunate, but that the guiding principle for restoration and redevelopment of the area should be based on the natural restoration of the rivers. Due to the compelling advantages of a new bridge for river restoration, the group chose to recommend this alternative.

Natural Resource Restoration Benefits of the Project

Primary benefits of the project are the restoration of aquatic resources and riparian habitat. The removal of the current bridge and all three concrete piers will allow restoration of a naturally functioning river channel as part of the restoration of the Clark Fork and Blackfoot Rivers

following removal of the Milltown Dam. Removal of two approach piers will further reduce the constriction of the river channel during high flow conditions.

By removing pier obstructions from the river channel and floodplain this alternative would allow the new river channel to be constructed under the natural design principles proposed by the State and Natural Resource Trustees as part of the State Restoration Plan. The river would not have to be locked into place on one side of the floodplain or the other, and maintained in that location through the use of riprap, rock structures or other engineering controls. The river would be able to move naturally across the floodplain over time. Riparian vegetation and habitat would be maximized by providing the river access to the entire floodplain, free of obstructions, riprap and artificial structures.

The existing bridge will be replaced with a three span pedestrian bridge with no piers constraining the river channel. Two 30 inch column drilled piers will be located at the bridge approach sections, minimizing encroachment on the river at high flows.

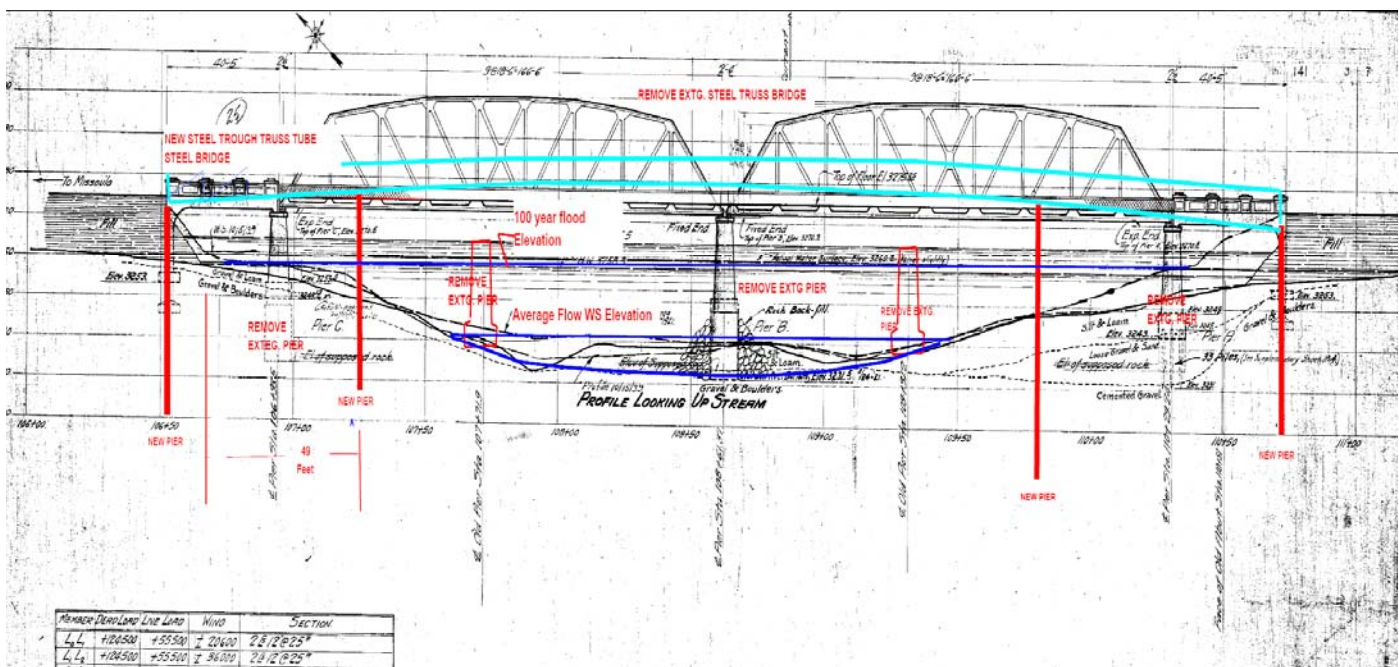


Figure 5 Cross Section Showing Existing Bridge, Existing Pier Locations, and New Pier Locations

Secondary Benefits of the Project

Secondary benefits of the project include provision of transportation and recreation services for the local community and visitors. As discussed earlier, the bridge will link to new pedestrian and recreational trails planned by the County and Redevelopment Working Group for local residents of West Riverside, Pinegrove, Marshall Grade, Milltown, Piltzville and Bonner. These include residential areas that will be affected by construction traffic during the remediation of the Milltown Reservoir beginning in late 2006. The bridge will also provide a critical link to a recreational trail system planned by the Redevelopment Working Group and County for the area following remediation and dam removal. This plan includes construction of additional recreation

trail in the area and an additional footbridge located below the confluence of the two rivers and the current Milltown dam site, as originally proposed for federal transportation bill funding. The new trails would eventually link up with planned trails to be constructed in the second project phase, within the Milltown Reservoir remediation and restoration project area. These trails can not be constructed until remediation and restoration is complete, approximately five years from now. The trails would provide unique and exciting non-motorized recreation opportunities, linking to Missoula's riverfront trail system, the Bandmann Flats Golf Course, the Two Rivers Community Park, Turah Fishing Access Site, Bonner School and Weigh Station Fishing Access Site. The Weigh Station Access Site would be improved with boat ramp, toilets, parking and vegetation planting. New river access sites would be constructed near the Bonner Bridge and below the river confluence in the second phase of the project. The Bonner Bridge would provide a critical link to all of the resources, including access for local residents in Milltown and Bonner to new park, trail and river access facilities, and exciting loop trail opportunities linking to Missoula's Kim Williams Trail, the proposed interpretive center at the restored confluence, the Blackfoot River and upper Clark Fork River. Figure 6 shows the park, trail and visitor facilities proposed by the Milltown Superfund Site Redevelopment Working Group and Missoula County for the restored confluence area following removal of Milltown Dam.



Figure 6 Milltown Area Redevelopment Conceptual Plan

Removal of the center pier and abandoned piers would also benefit public safety. The piers would not remain in place and pose a threat to public safety for people who float the river in boats and inner tubes.

Removal of the piers would eliminate an obstruction to the passage of ice and debris during high flows, which could cause structural stability problems for the bridge, restored river channel or embankments bordering adjacent residential or commercial properties.

Project Schedule

The project would be initiated in mid 2006 with detailed engineering and project bidding activities. Bridge demolition would occur in spring or early summer 2007. The new bridge would be installed by the end of August, 2007 prior to the new school year. A detailed project timeline is included below.

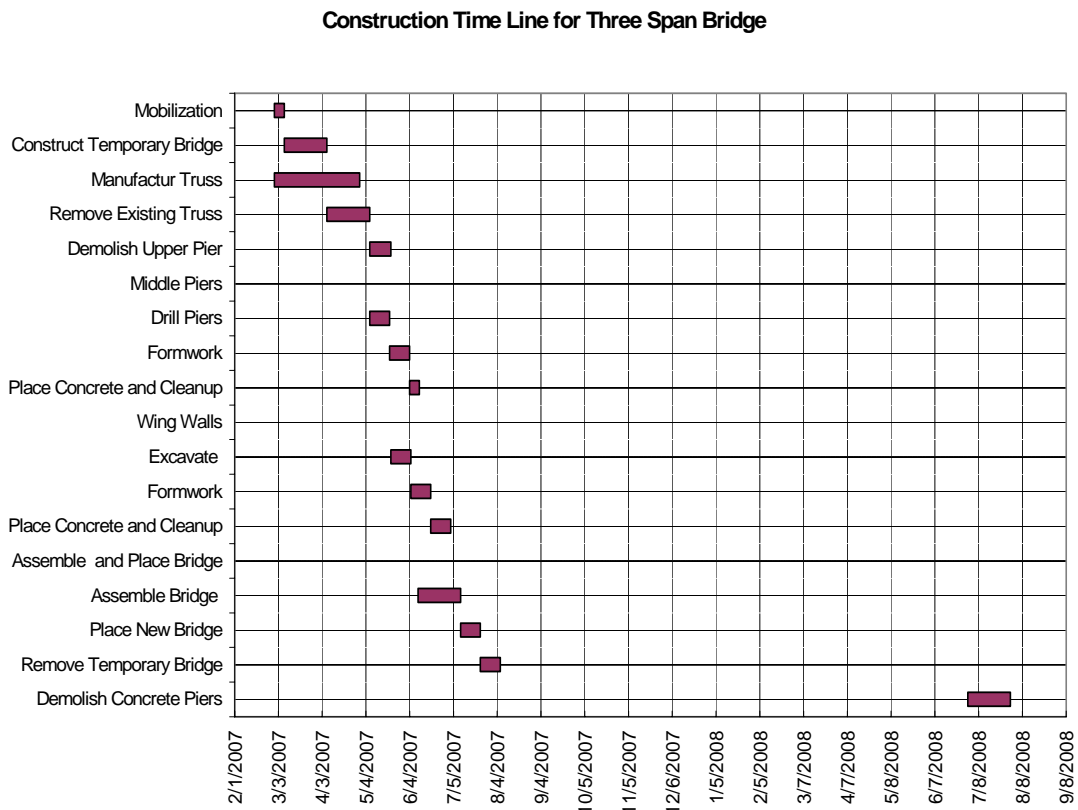


Figure 7

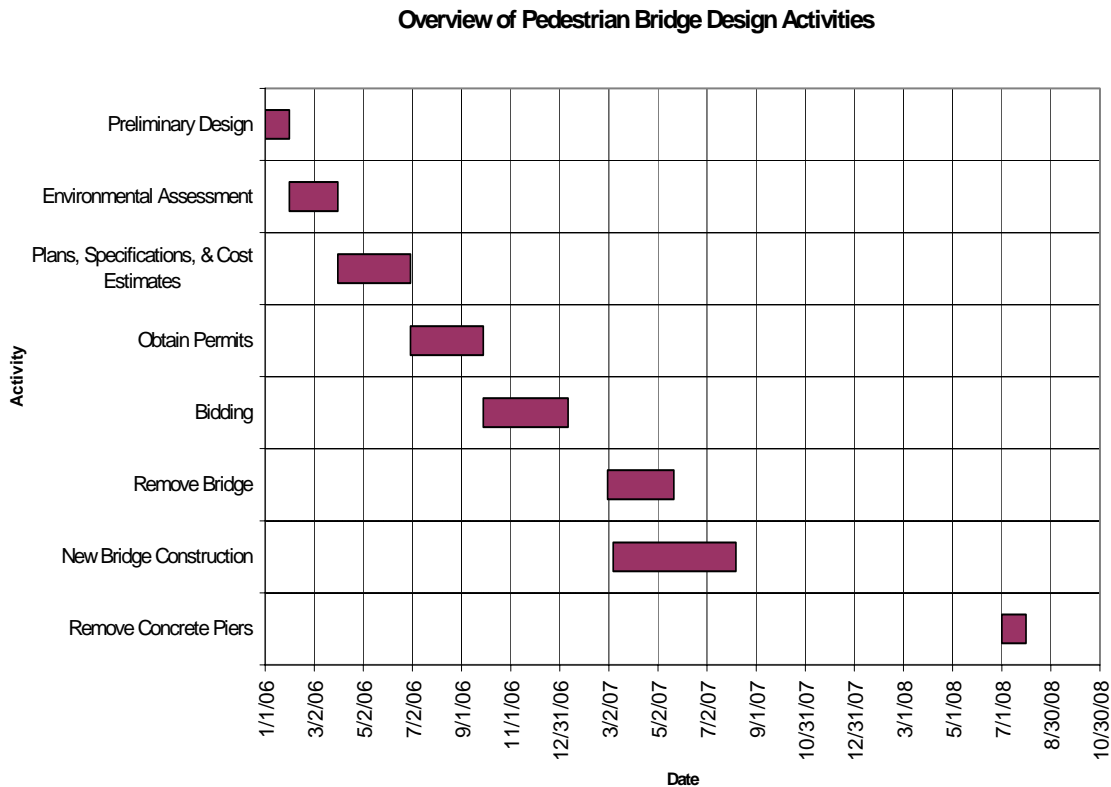


Figure 8 Overview of Design and Construction Activities

Proposed Bridge Design

The proposed bridge design is a prefabricated truss pedestrian bridge. Initial designs and cost estimates have been provided by Roscoe Steel in Missoula, and Continental Bridge. The bridge would be constructed with weathering steel, which does not require painting and associated ongoing maintenance. The bridge deck would be either concrete or Ipe hardwood. Both of these alternatives reduce long-term maintenance requirements and eliminate the need for wood treatment chemicals such as chromated copper arsenate or other copper-derived treatments. Since the Superfund cleanup remedy at the Milltown site is intended to remove hazards to humans and aquatic life associated with copper and arsenic, it is particularly appropriate to avoid the use of these wood preservative substances for the new bridge. Photos 1, 2, and 3 show similar bridges, courtesy Roscoe Steel in Missoula.



Photo 1 – photo courtesy Roscoe Steel



Photo 2 – photo courtesy Roscoe Steel



Photo 3 – photo courtesy Roscoe Steel

Three Span Bridge Construction Procedure

The demolition and construction of the bridge would occur during Stage 1 drawdown for the Milltown Dam demolition work, when the water elevation in the BFR is approximately 10 feet below the current reservoir water elevation, approximately elevation 3754. In this condition most of the piers are inaccessible by land. State 1 drawdown is planned to begin in mid to late 2006, and extend through October, 2007.

Construction of a temporary bridge, immediately upstream or downstream of the existing structure would be required to access and remove the existing structure and would also be used to facilitate construction of new piers and erection of the new bridge. The bridge superstructure would be manufactured by one of several potential companies that provide a range of standard pedestrian bridge models. The structure would be shipped to the site in segments to be assembled at the site and launched onto the new concrete piers.

The existing Bonner Bridge steel trusses would be pulled onto the shore to facilitate dismantling the structures. Relocating the bridge structure to the shore will require temporary supports between the piers to allow the steel trusses to be pulled to land for demolition. The existing pier remnants from the bridge that preceded this bridge may be used to support the trusses as they are moved.

After the trusses are removed the concrete piers would be demolished. Two approaches for pier demolition were investigated. The first would involve removing all of the existing piers in the

initial 10 foot drawdown. Since water surface elevations will be at least 12 feet above the riverbed elevation at the center pier, demolition would involve removing material underwater using either a backhoe or clamshell. Cofferdam construction may be required to contain demolished concrete.

An alternate approach to pier removal would demolish pier concrete above the water line from the temporary bridge. The remaining structure could be used for temporary shoring used to launch the bridge superstructure. After Milltown Dam removal and the final water elevations are established, the remaining portions of the piers would be removed using backhoes, possibly under a separate contract. This approach would allow most of the work to be done under low flow conditions and potentially be a less costly approach because demolition work could be done in dry conditions and access would be by land. It would, however, involve remobilization of equipment a year after the completion of the new bridge construction. This approach was used for cost and schedule estimates.

Two piers, consisting of two approximately 30 inch diameter concrete columns, located 250 apart would be constructed. The piers would be located in shallow water at the edge of the water elevation during the first 10 foot drawdown. Water depth at the piers would be 2 or 3 feet. Small cofferdams may need to be constructed to protect the drilling operations. Reinforced concrete piers would be constructed continuously from rock to the pier cap. Concrete abutments with wing walls to reduce loss of embankment material would be constructed at each end of the bridge.

The assembled steel superstructure would be “launched” using the new and existing piers for temporary support. Additional temporary bents may be constructed along the bridge alignment to support the bridge as it is moved into its final position. The temporary construction bridge would be disassembled after placing the new bridge. As discussed above, concrete pier demolition would occur the following year when the free flowing river has been reestablished beneath the bridge.

Temporary pedestrian passage over the Blackfoot River will be provided by routing vehicle traffic to the southwest side of the bridge in two 12 foot traffic lanes, widening the existing pedestrian lane to 8 feet, and installing continuous jersey barriers to separate vehicle and pedestrian lanes. Jersey barriers will be pinned to the bridge deck and secured with cable. MDT will be consulted regarding potential vehicle speed restrictions.

Streambank revegetation

Streambanks and the right-of-way disturbed by removal and installation of the bridges will be restored using native plant species consistent with revegetation plans for the State Restoration Plan. Floodplain and riparian area revegetation will be completed by the Restoration Program when it completes restoration of the BFR 1 segment. The County will revegetate approaches and embankments consistent with the State’s restoration plan, using native species. Public access to the river and footpaths on the east side of the bridge will be provided with a semi-primitive trail and steps constructed of rock, logs and other natural materials. This trail will direct public visitors down the slope without impacting restored vegetation.

Revegetation conducted under this project will occur within the County's 60 foot right of way extending on each bank from the upland area at the bridge terminus down the embankment to the 100 year floodplain. Restoration work below the 100-year floodplain will be conducted by the State of Montana as part of its restoration plan for the Blackfoot River. Revegetation work will include installing nine inch diameter rice straw erosion control contour wattles on the embankments across the steep portions of the 60 foot right of way at six foot intervals. Fine compost will be applied to the entire area to a thickness of approximately one quarter inch. A fast germinating native grass and forb seed mix will be applied, similar to the upland buffer zone seed mixes planned for use by the Restoration Program. One gallon shrubs will be planted on six foot centers. Shrub species may include willow, chokecherry, snowberry, mock orange, hawthorne, gooseberry and rose. Approximately 20 one gallon trees will also be planted outside a 10-15 foot buffer zone from the bridge. Tree species may include ponderosa pine and cottonwood. Woody debris will be scattered throughout the revegetation area to provide microsite diversity, and enhance erosion control and water retention. Shrubs and trees will be deep watered regularly throughout the growing season for a minimum of two years.

Project Staff

The project will be coordinated by Missoula County staff, including Public Works Director Greg Robertson, engineers Tim Elsea and Erik Dickson, and Environmental Health Supervisor Peter Nielsen. Project management is estimated at 1% of total project costs. Missoula County will document actual project management costs.

Contracted Services Required for Project

Missoula County has contracted with a professional engineer to evaluate alternatives for the project, select a preferred alternative, and develop cost estimates. When grant funds and federal transportation bill funds are available to the County, it will proceed with an open bid process for project engineering and design, procurement of the new bridge, demolition, disposal and new bridge installation services.

Qualifications of the Project Team

Greg Robertson, P.E. Missoula county Public Works Director
Tim Elsea, P.E., Assistant Director of Public Works
County Engineer Erik Dickson, P.E., Transportation/Bridge Engineer

All three have experience in design, construction and maintenance of bridges.

Peter Nielsen, M.S. R.S.
Dennis Gathard, P.E. Civil and Structural Engineer

Required Permits and Approvals

Permits and approvals required for this project will include a 310 permit from the local Conservation District, SPA 124 Permit from Fish, Wildlife and Parks, Floodplain Permit from Missoula County, Section 404 permit from the Corps of Engineers, 318 authorization from

Montana DEQ, and a Navigable River Land Use License/Easement/Land Transfer Agreement from Montana Department of Natural Resources. These permits will be applied for through the Joint application for Proposed Work in Montana's Streams, Wetlands, Floodplains and other Water Bodies. Discussions have been initiated with Montana DNRC regarding the Navigable River Easement to Missoula County. The project will involve the removal of a bridge built in 1921, and potentially considered to be a historic resource. Consultation with the State Historic Preservation Officer will be completed.

Project Cost, Grant Request and Match

Total project cost is \$1,300,870. The County requests a grant of \$975,652 from the Natural Resource Damage Program, and will provide \$325,218 in matching funds (25 % match).

ENVIRONMENTAL IMPACT CHECKLIST AND NARRATIVE

Applicant Name: Missoula County

Project Title: Bonner Bridge Replacement

A. Environmental Impact Checklist

Impacts to Physical Environment	No Impact	Potentially Adverse	Potentially Beneficial	Permits or Approvals Required	Mitigation Required
1. Soil suitability, geological or topographic constraints			XXX		
2. Air quality	XXX				
3. Groundwater resources and quality	XXX				
4. Surface water quality, quantity and distribution systems		XXX		XXX	XXX
5. Floodplains and floodplain management			XXX	XXX	
6. Wetlands protection			XXX	XXX	
7. Terrestrial and avian species and habitats			XXX		
8. Aquatic species and habitat			XXX		
9. Vegetation quantity, quality and species			XXX		
10. Unique, threatened or endangered species or habitats			XXX		

Impacts to Human Environment	No Impact	Potentially Adverse	Potentially Beneficial	Permits or Approval Required	Mitigation Required
11. Unique natural features			XXX		
12. Historical and archeological sites		XXX			
13. Aesthetics, visual quality			XXX		
14. Energy resources, consumption, and conservation			XXX		
15. Human Health and Safety		X short term	X long term	MDT approval required if Hwy 200 bridge used for temporary pedestrian passage	XX
16. Agricultural or industrial production	XXX				
17. Access to recreational activity, public lands, open space			XXX		
18. Nuisances (odor, dust, glare)	XXX				
19. Noise (e.g. separation between housing and construction areas)		XXX			XXX
20. Hazardous substance handling, transportation and disposal	XXX				
21. Local and state tax base and tax revenue	XXX				
22. Employment, population, or housing	XXX				
23. Industrial and commercial activity	XXX				
24. Land use compatibility; Consistency with local ordinances, or solutions, or plans	XXX				
25. Demands for governmental services (e.g. site security, fire protection, community water supply, wastewater or stormwater treatment, solid waste management)	XXX				

Impacts to Human Environment	No Impact	Potentially Adverse	Potentially Beneficial	Permits or Approval Required	Mitigation Required
26. Transportation networks and traffic flow			XXX		
27. Social structures and mores			XXX		
28. Cultural uniqueness and diversity	XXX				

B. Environmental Impact Narrative

1. Soil suitability, geological or topographic constraints

2. Air Quality

The project will have little or no impact on air quality. If necessary, visible dust emissions created by construction equipment on the river banks will be controlled with water trucks.

3. Groundwater Resources and Quality

The project will have no impact on groundwater resources or quality. The bridge design will not require use of wood preservatives such as chromated copper arsenate. The deck will be constructed of concrete or rot resistant, organically grown lpe hardwood. The structural components of the bridge will be constructed of weathering steel, which does not require painting.

4. Surface Water Quality, Quantity and Distribution systems

The project may have short-term impacts on surface water quality during removal of the center pier and possibly during removal of the abutment piers and reshaping of the abutments prior to placement of the new bridge. These impacts will be minimal when compared to the impacts of sediment scouring that will occur during stage 2 and 3 drawdown for the Milltown Dam removal project, which will occur following completion of this project. Potential impacts will be mitigated by several factors and by project scheduling. All of the work will be done within the Milltown Reservoir prior to dam removal. Some disturbed sediments from pier removal will be retained within the reservoir. Project Scheduling will avoid potential impacts to the river and aquatic life during periods of low flow in late July and August when the river is clear and aquatic life is most sensitive. Silt screens may be used to control sediment released from pier removal. Potential releases of sediment from the abutment removal and reshaping will be controlled through application of best management practices typically used for excavation projects near water bodies, including use of silt fences and straw bales at the base of disturbed slopes. Disturbed areas will be revegetated to further reduce potential erosion. The bridge design will not require use of wood preservatives such as chromated copper arsenate. The deck will be constructed of concrete or rot resistant, organically grown lpe hardwood. The structural components of the bridge will be constructed of weathering steel, which does not require painting.

5. Floodplains and floodplain management

The project will have a positive impact on the floodplain and its management. Five piers constituting obstructions to river flow will be removed during the project. Two 30-inch column approach piers will be installed, minimizing impact on flood passage. The replacement bridge will be built at or near the same grade as the current bridge in order to maintain approach grades. This will result in the bridge being far above the 100-year flood elevation, posing no threat of obstruction of flow or debris passage.

6. Wetlands Protection

The project will enhance wetland protection in the project area by removing obstructions to river flow, and allowing natural channel design principles to be used in the restoration design while avoiding the use of non-natural structures, rip rap or other engineered controls to protect bridge pilings. The use of natural design principles will maximize benefits to potential fluvial wetlands in the project vicinity.

7. Terrestrial and Avian Species and Habitats

The project will enhance terrestrial and avian species and habitats in the project area by removing obstructions to river flow, and allowing natural channel design principles to be used in the restoration design while avoiding the use of non-natural structures, rip rap or other engineered controls to protect bridge pilings. The use of natural design principles will maximize benefits to riparian habitat in the project vicinity.

8. Aquatic Species and Habitat

The project will enhance and improve bull trout habitat and fish passage, aquatic species and habitat in the project area by removing obstructions to river flow, and allowing natural channel design principles to be used in the restoration design while avoiding the use of non-natural structures, rip rap or other engineered controls to protect bridge pilings. The use of natural design principles will maximize benefits to aquatic species and habitat in the project vicinity. . Short-term impacts caused by the implementation this project (pier removal, bridge removal, new bridge placement) might effect bull trout. Best management practices and consultation with the EPA, USFWS, and the State will mitigate these impacts.

9. Vegetation Quality, Quantity and Species

The project will enhance native vegetation quality, quantity and species in the project area by removing obstructions to river flow, and allowing natural channel design principles to be used in the restoration design while avoiding the use of non-natural structures, rip rap or other engineered controls to protect bridge pilings. The use of natural design principles will maximize benefits to riparian vegetation in the project vicinity. Revegetation of disturbed areas will be performed in coordination with the objectives of the State Restoration Plan.

10. Unique, threatened or endangered species or habitats

The project will enhance unique, threatened or endangered species or habitats in the project area by removing obstructions to river flow, and allowing natural channel design principles to be used in the restoration design while avoiding the use of non-natural structures, rip rap or other engineered controls to protect bridge pilings. The use of natural design principles will maximize benefits to bull trout and bald eagles in the project vicinity. The project will enhance bull trout habitat and improve fish passage. There may be short-term impacts as a result of sediment release during pier removal.

11. Unique natural features

The restored Blackfoot River channel will constitute a unique natural feature. The project will benefit this resource by supporting the Draft Restoration Plan goals of providing a naturally functioning river channel without the use of artificial rip rap or engineering controls to protect bridge pilings.

12. Historical and archeological sites

The project will involve the removal of a bridge built in 1921, and potentially considered to be a historic resource. Consultation with the State Historic Preservation Officer will be completed.

13. Aesthetics, visual quality

The project will have a generally positive impact on aesthetics and visual quality. While the current Bonner Bridge is considered historic, it has begun to show its age. The bridge deck and guard rails are badly deteriorated, and the west approach has developed a large hole in the pavement as a result of erosion of material under the approach. The new bridge will be low profile as compared to the existing bridge, and the design will be attractive. Disturbed areas of streambank will be revegetated with appropriate species, including native species of grasses and shrubs that will help preclude the establishment of unsightly weeds.

14. Energy resources, consumption, and conservation

The project will have a positive impact on energy resources, consumption and conservation. It will maintain and enhance an alternative, non-motorized transportation route for local residents, including children that attend the Bonner School. The bridge lighting will be a high efficiency LED system.

15. Human Health and Safety

The project will benefit public safety in the long-term by providing a safe and reliable means of pedestrian transportation. During the construction project public access to the bridge will be restricted or prohibited to protect public safety. An alternate means of pedestrian transportation across the Blackfoot River will be provided during construction. This must be carefully coordinated with work that will be performed by EPA on the Highway 200 and Interstate 90 bridges. Safe pedestrian passage can be provided by widening the pedestrian lane on Highway 200 to 8 feet, reducing traffic lanes to 12 feet, and protecting the pedestrian lane with continuous jersey barriers separating it from traffic lanes. MDT will also be consulted regarding potential speed limit restrictions during the project.

16. Agricultural or industrial production

No impact expected

17. Access to recreational activity, public lands, open space

Access to recreational activity, public lands and open space will be greatly enhanced by completion of this project. The bridge will link to non-motorized transportation routes, and a unique recreational trail system that will extend and provide loop trail options from Missoula's Riverfront Trail system to Milltown, through the restored confluence area and proposed park/interpretive center facilities, up the Clark Fork to the Turah Fishing Access site, and up the Blackfoot past Bonner School to the Weigh Station Fishing Access Site. Public access to the river and trails will be provided on both ends of the proposed bridge. Public access to the planned riverfront trail on the west bank of the river will be handicap accessible. The trail to the river confluence and proposed Interpretive Center is proposed to be hard-surfaced and handicap accessible.

18. Nuisances (odor, dust, glare)

The project is expected to create little or no nuisance related to odor, dust or glare.

19. Noise (e.g. separation between housing and construction areas)

The project will be completed near the residential neighborhood of Milltown on the east bank of the river. Noise impacts will be mitigated by scheduling the work day to include regular working hours, and using the less populated west bank of the river for the majority of equipment staging, debris hauling and other activity.

20. Hazardous substance handling, transportation and disposal

No hazardous materials will be handled or transported during the project.

21. Local and state tax base and tax revenue

The project will have little direct impact on local or state tax base or tax revenue. Business equipment used during the project may generate local and state business equipment taxes. In the long-term, creation of the riverfront trail system, footbridges, parks and river access site improvements are expected to have a significant beneficial effect on local property values, and local and state tax revenue.

22. Employment, population, or housing

The project will have a short-term positive impact on employment.

23. Industrial and commercial activity

No impacts to industrial activity are expected. Commercial activity in the Bonner/Milltown area may benefit in the long-term from the project and its connecting trails and park facilities.

24. Land use compatibility; Consistency with local ordinances, or solutions, or plans

No impact

25. Demands for governmental services (e.g. site security, fire protection, community water supply, wastewater or stormwater treatment, solid waste management)

No impact

26. Transportation networks and traffic flow

The project will have a substantial positive impact on transportation networks and traffic flow by maintaining and enhancing a non-motorized transportation alternative and non-motorized recreation alternative through the bridge and the trails to which it links in the community and surrounding area.

27. Social structures and mores

The project will maintain a footbridge linking West Riverside to Milltown and Bonner, maintaining social relationships between the two communities and traditions of safe pedestrian passage from one side of the river to the other.

28. Cultural uniqueness and diversity

No impact.

CRITERIA STATEMENTS

Applicant Name: Missoula County

Project Title: Bonner Pedestrian Bridge Replacement

STAGE 1 GENERAL LEGAL CRITERIA

- 1. Technical Feasibility See Technical Narrative**
- 2. Relationship of Expected Costs to Expected Benefits**

The Bonner Pedestrian Bridge project will cost \$1,300,870. Direct Benefits of the project include restoration of aquatic and riparian resources through removal of bridge piers that would obstruct the river and revegetation of disturbed and degraded streambanks. Indirect benefits include the retention and enhancement of a critical pedestrian travel route for local communities and linking of recreational trail systems providing public access to parks, restored areas, river access sites and neighboring communities. Other indirect benefits include the protection of streambanks on neighboring residential and commercial properties and restored areas from flood, ice and debris

The Bonner Bridge project will make a significant contribution to the restoration of aquatic and terrestrial resources with the removal concrete piers from the river and the establishment of varieties of native plants on County owned land at and near the bridge site. The restoration benefits of the project will extend for some distance upstream and downstream of the immediate project area because the removal of piers from the river will allow restoration designers to use natural design principles and create a smooth transition between upstream and downstream reaches without routing the river through a heavily engineered channel under the bridge.

The public benefits of the project are substantial. It is difficult to quantify the value of a restored river, but Missoula County and the Missoula Superfund Site Redevelopment Working Group have concluded that the potential benefits are substantial. The Working Group and County have adopted a redevelopment plan for the Bonner and Milltown areas that is based upon the natural restoration of the Blackfoot and Clark Fork Rivers and development of publicly owned park, trails, footbridges, river access sites and a unique interpretive center at the restored river confluence. After restoration is complete, the open space, wetlands, natural areas, trails, and new recreation opportunities will increase the value of nearby properties. Increases of 10-30% have occurred in similar “greenway developments” in other cities. The attractiveness of the restored

greenway will bring new residents and businesses, all of which will contribute to a healthier local economy.

The project will maintain and enhance the pedestrian link between communities on both sides of the river. If the bridge is not replaced, it will become unstable for use following removal of the Milltown Dam. The Highway 200 Bridge can not accommodate a pedestrian lane or accessory pedestrian bridge due to lane width restrictions and structural stability limitations. If the Bonner Bridge is not replaced following dam removal, there would be no safe pedestrian travel link for residents of communities such as West Riverside and Pinegrove on the west side of the river to Milltown and Bonner on the east side. Of particular importance is the link for schoolchildren who attend the Bonner School (K-8). The most densely populated portion of the Bonner School District is located in the West Riverside and Pinegrove Areas, while the school is located in Bonner east of the river. If the bridge project prevents one serious injury or death of a Bonner School student or other local resident trying to cross the unsafe Highway 200 bridge, it will be well worth the cost. Replacement of the Bonner Bridge will provide very substantial and long-term benefits for families that need a safe pedestrian route for their kids to attend school.



Photo 4 Bonner School Student Returning From School Across Bonner Bridge

The project will also have substantial benefits for outdoor recreation. It will link to a trail and footbridge system proposed by the Milltown Redevelopment Working Group and Missoula County. Partial funding for the first phase of this trail system has been received through the federal transportation bill. The trail system will link the Kim Williams Trail in Missoula's downtown riverfront to the restored confluence area and proposed park and interpretive center. The trails will extend through West Riverside, Milltown and Bonner, past the Bonner School and upstream to the Turah Fishing Access site on the Clark Fork River and the Weigh Station Access site on the Blackfoot River. An additional river access site is proposed adjacent to the Bonner Bridge on the west side of the river. Two other pedestrian bridges are proposed, one located below the current location of Milltown Dam and another about one mile upstream of the dam at a location known locally as the Duck Bridge. Funds are not requested from the upper Clark Fork Restoration Fund for the connecting trail projects as part of this application. But the Bonner Bridge replacement is critical to complete the trail system and provide access to the trail for local residents on both sides of the river.

3. Cost Effectiveness

Missoula County analyzed alternatives to the proposed project. These included repairing the existing bridge using its existing river piers, removing the bridge and constructing a pedestrian lane or accessory bridge on Highway 200 Bridge, replacing the existing bridge with a new two span bridge with new river pilings, and replacing the existing bridge with a new single span bridge or three span bridge. Several new bridge designs were considered, including a pre fabricated truss, cable stay and suspension bridge designs.

Replacement with a single span bridge or a three span bridge were the only alternatives that provided the natural resource benefits associated with removing all bridge piers from the river. Replacement with a new two span bridge with new center pier was the least expensive alternative considered. Because this alternatives conflict with goals of the Natural Resource Restoration Plan for the river, the Redevelopment Group and County propose to proceed with a replacement bridge alternative.

No Action Alternative

The “no action” alternative was considered but found unacceptable. If no action is taken to repair or replace the bridge, it will become structurally unstable and unsafe following removal of the Milltown Dam. If the bridge were removed and not replaced, it would eliminate the only safe pedestrian river crossing for local residents and recreational visitors. If the bridge was not replaced it would greatly diminish the unique qualities of the proposed trail and footbridge system proposed by the Redevelopment Working Group and the County.

Description of Options for Retaining Existing Structure

Construct a Protective Collar around Existing Pier Foundations

In this approach, pier support would be maintained by confinement of the material beneath the existing pier foundation by the collar wall. Scour beneath the existing bridge pier footing would be prevented by constructing a concrete collar wall around the perimeter of the existing pier foundation starting near the top of the existing foundation and extending below the projected scour elevation. The center and west end piers appear to be supported by spread footing foundations on native alluvial material. At the center and west end pier the new scour protection wall would be excavated and constructed in segments small enough to ensure that loss of foundation support does not occur from excavation for the wall.

The pier at the east end of the truss span is founded on wooden piles. Since alluvium at this location is composed of material soft enough to drive piles, confinement can be accomplished using steel sheet piles instead of the more expensive concrete approach. Steel sheet piles could be driven from the deck of the bridge structure and cut off at the top of the foundation. A concrete cap would connect the sheet piles to the existing foundation.

Construct New Drilled Piers.

This approach would construct a series of drilled concrete piers around the perimeter of the existing foundation. While the collar wall approach seeks to confine existing material beneath the foundation, this approach would provide an alternate load path by constructing new piers to support the structure. Six 4-foot diameter and fourteen 3-foot diameter piers would provide support for the center pier. Approximately 100 one-inch high strength steel reinforcing bars would be drilled and grouted into the existing foundation to transfer vertical loads from the existing pier to the new drilled piers through the new concrete cap. Construction of the pier cap would require a temporary cofferdam for excavation and placement of the cap concrete.

Construct New Center Pier

As an alternative to providing scour protection for the existing center pier, which is founded on alluvium, the center pier would be demolished. A new pier founded well below the scour depth on high strength material would replace the existing center pier. Modern materials and construction techniques would allow the size of the pier to be considerably smaller and stronger than the existing pier. The existing superstructure transfers vertical loads to the center pier through a diagonal strut at the end of the truss. Before demolition of the old center pier could occur, temporary supports would be constructed beneath structure on each side of the existing center pier. Support at the temporary support bent would require that a temporary diagonal strut be installed from the top of the structure to the point of support to transfer vertical loads.

Reroute Pedestrian Traffic to SH 200 Bridge

An alternative to providing access in the existing bridge alignment would route pedestrian traffic across State Highway Bridge 200. For several reasons, adding pedestrian traffic to this bridge is not feasible. The bridge was designed in the 1940's and is not built to contemporary standards. Adding a pedestrian walkway to the bridge would require upgrading structural capacity of the bridge. Additional work would be required to widen the roadway shoulder on both ends of the bridge. Retrofitting and reconfiguring an existing steel bridge to support new loads would be much more costly than purchasing a new pedestrian bridge from a bridge manufacturer that produces the structures in a factory in a cost competitive manner. Finally, the pedestrian walkway would create eccentric loads on the foundation. An increased load on the center pier, especially an eccentric load, might require additional pier retrofitting and further increase the overall cost for this approach. This alternative was not developed in further detail because of construction cost associated with upgrading the Highway 200 bridge.

New Bridge Options

Single Span Bridge

This option would remove the existing bridge completely and replace it with a new steel single span bridge extending 415 feet from the location of the current abutments. New abutments and

wing walls would support the bridge at each end. Several alternative single span structures were investigated. The least cost structure would be similar to typical pedestrian tube steel truss bridges except that it would be approximately twice as deep, approximately 20 feet at the midspan. A single span bridge of this length would require additional engineering design and may need to be wider than a multi-span “off the shelf” pedestrian bridge for stability reasons. The maximum length of an “off the shelf” bridge is approximately 250 feet. Longer spans involve more specialized engineering and construction and therefore cost more than a comparable multi-span bridge.

Two Span Bridge

A two span bridge would require two simple spans of approximately 207 feet each. A new center pier composed of two 30-36 inch concrete columns with a concrete cap would be constructed near the center of the BFR. This would cause flow restrictions in the river. New abutments and wing walls would be constructed at the current ends of the existing bridge.

Three Span Bridge

A three span bridge would avoid affects on river flow by locating new piers outside of the future BFR river alignment. Estimated bankfull river width at the bridge is approximately 175 feet. This river width would occur on average approximately every other year. The approach proposed for a three span bridge would place new piers on either side of the river bankfull condition, approximately 250 apart. Some future high flow events could widen the river beyond the pier locations but such events would be rare and flow velocities would be lower near the piers than at the middle of the river. Concrete piers would be constructed to a depth below the riverbed that exceeded maximum scour depths and founded on bedrock or material of similar strength.

Preferred Alternative

The preferred alternative among the approaches described above would be to demolish the existing through-truss bridge with all of its elements completely, remove the remnant piers of the bridge prior to the current bridge, and construct a new three span bridge in the current Bonner Bridge alignment. Because of the reduced span, this approach is significantly less expensive than a new single span bridge but still avoids the negative impacts to the river from piers located in the river flow that would result from upgrading the existing bridge or constructing a new two span bridge. A 250-foot center span would be built as the center section for the new bridge, providing ample room for the restored Blackfoot River channel.

By removing pier obstructions from the river channel this alternative would allow the new river channel to be constructed under the natural design principles proposed by the State and Natural Resource Trustees as part of the draft Restoration Plan. The river would not have to be locked into place on one side of the floodplain or the other, and maintained in that location through the use of riprap, rock structures or other engineering controls. The river would be able to move naturally across the floodplain over time. Riparian vegetation and habitat would be maximized by providing the river access to the entire floodplain, free of obstructions, riprap and artificial structures. The center pier would not remain in place and pose a threat to public safety for river

recreation users. It would not provide an obstruction to the passage of ice and debris during high flows, or potentially trap such debris or ice causing structural stability problems for the bridge, restored river channel or embankments bordering adjacent residential or commercial properties. The three-span bridge design would also provide significant cost savings for the State Restoration Plan, since it would not require hard engineering to lock the river in place to protect the bridge.

Table 1
Cost Comparison for All Approaches Considered
Excluding Lighting and Revegetation Costs

Drilled piers	
Scour Protection	\$ 855,353
Repair and Paint	\$ 568,750
Total Cost	\$ 1,424,103
Collar Wall	
Scour Protection	\$ 1,086,134
Repair and Paint	\$ 568,750
Total Cost	\$ 1,654,884
New Center Pier	
Scour Protection	\$ 909,884
Repair and Paint	\$ 568,750
Total Cost	\$ 1,478,634
New Three Span Bridge	\$ 1,202,049
New Two Span Bridge	\$ 1,122,512
New Single Span Through Truss Bridge	\$ 1,748,160
New Cable Stayed Bridge	\$ 1,934,336

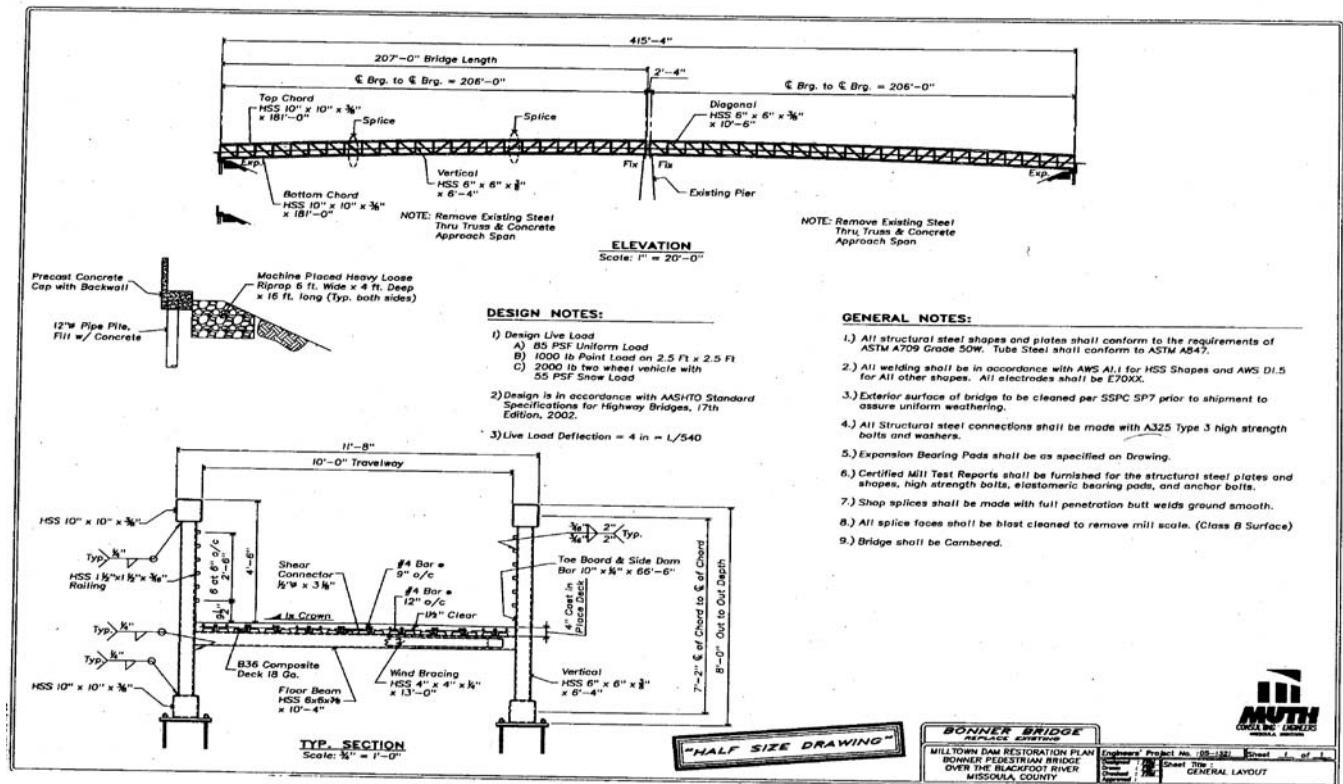


Figure 9 Two Span Pre Fabricated Pedestrian Bridge

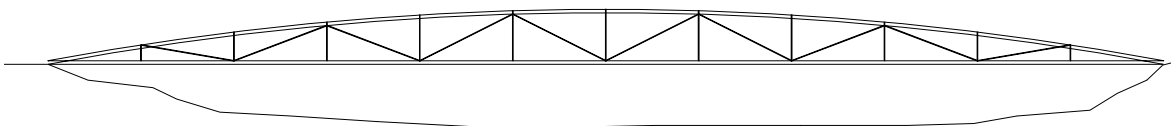


Figure 10 Single Span Truss Bridge

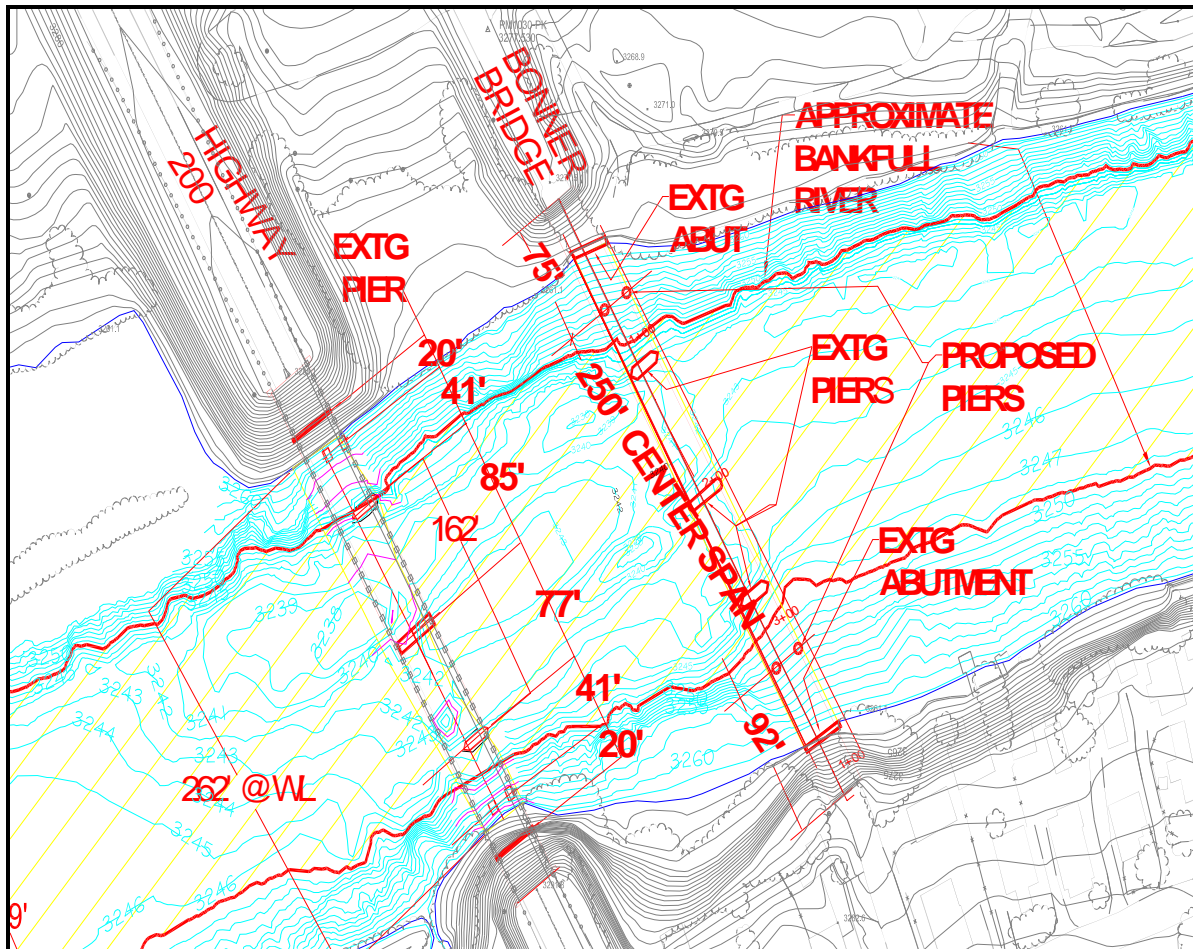


Figure 11 Plan view Of Blackfoot River Showing Three-Span Bonner Pedestrian Bridge And Highway 200 Bridge

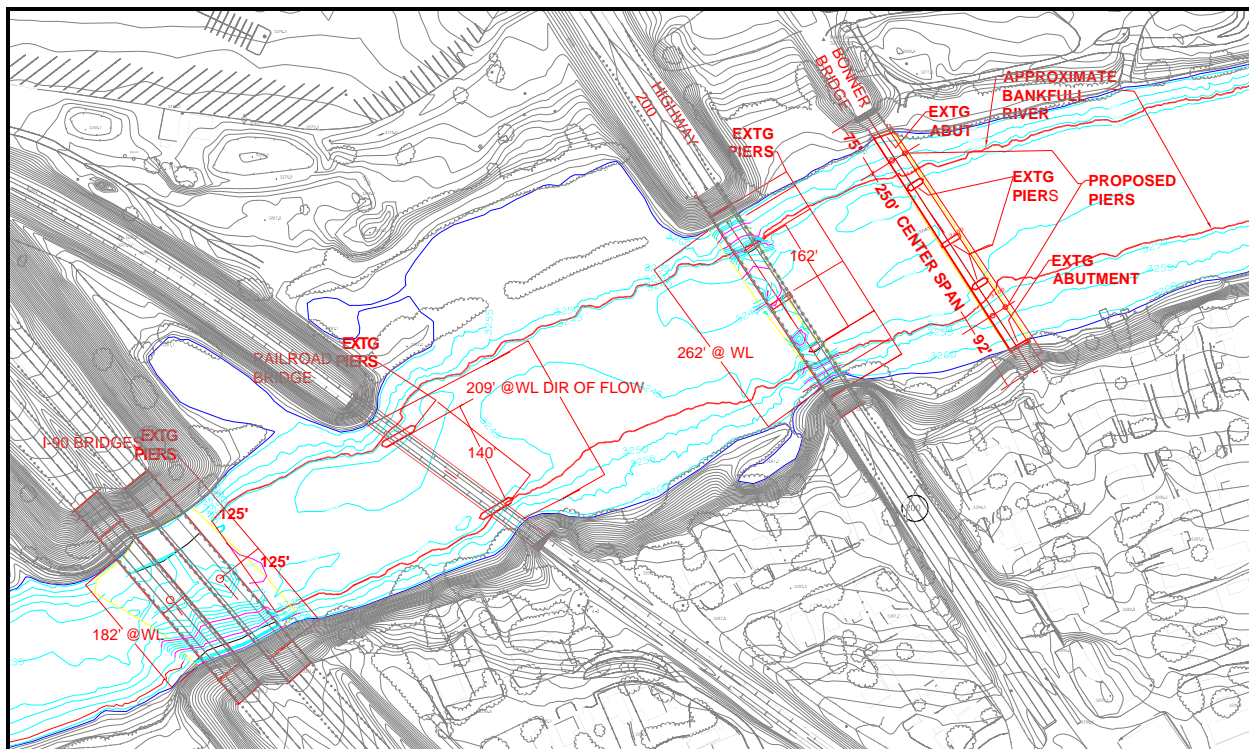


Figure 12 Plan View of Blackfoot River Showing All Bridges

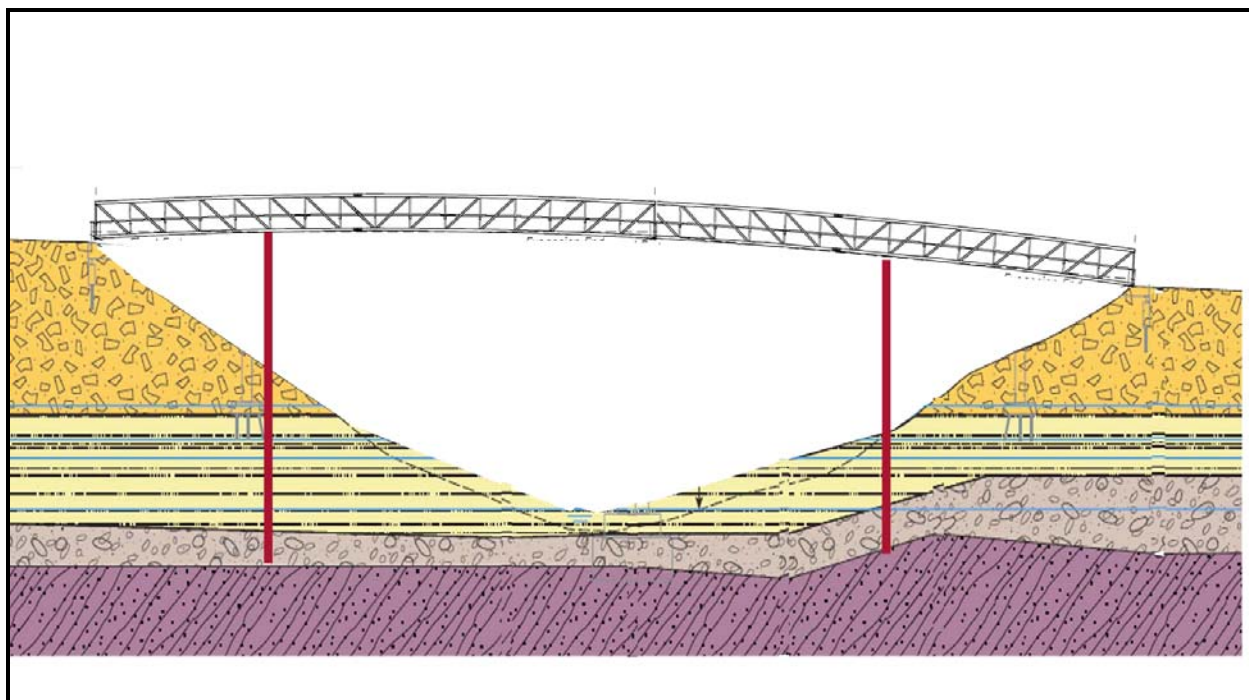


Figure 13 Cross Section of New Three Span Pedestrian Bridge

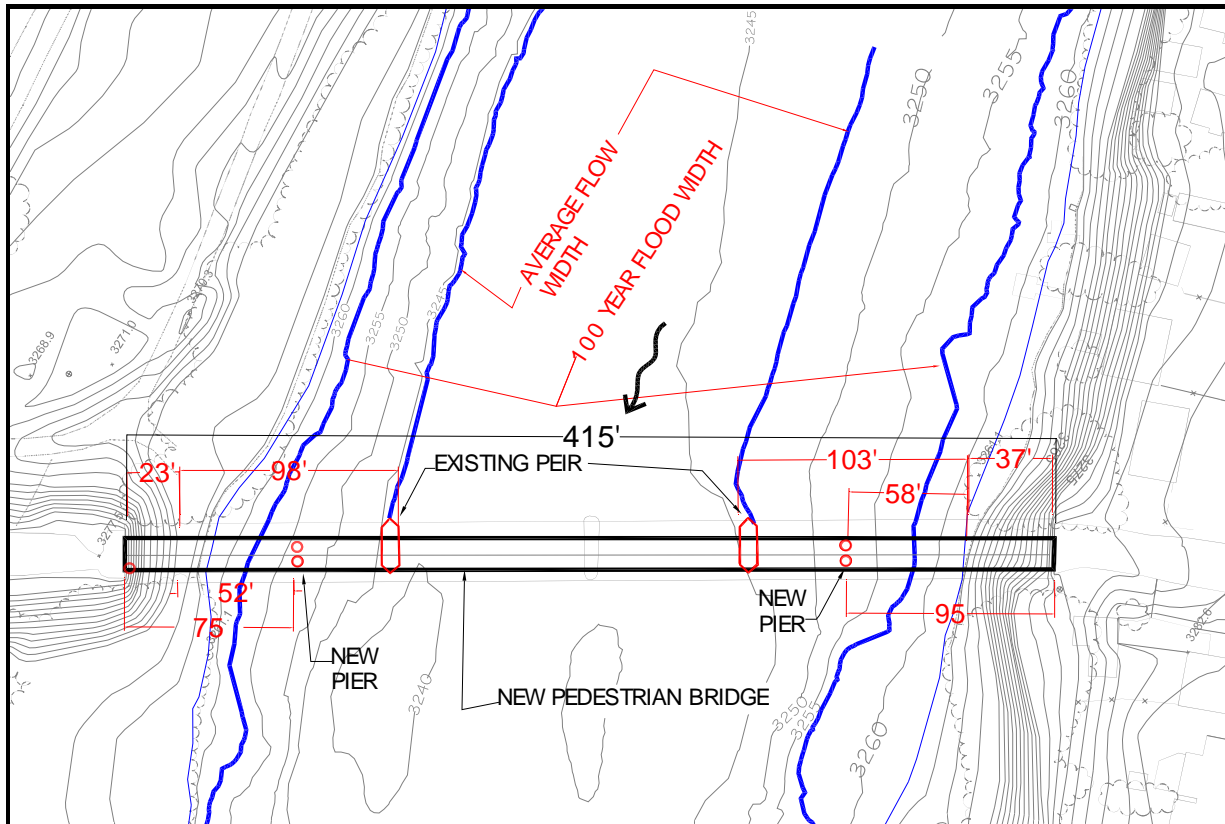


Figure 14 Plan View of New Pedestrian Bridge showing distance of new and existing piers from embankments

4. **Environmental Impacts** **NO RESPONSE REQUIRED**
5. **Human Health and Safety Impacts** **NO RESPONSE REQUIRED**
6. **Results of Superfund Response Actions**

The Bonner Bridge mitigation is required as a direct result of Superfund remedy for the Milltown Reservoir site. When the Milltown Dam is removed, the bridge would become unstable and unsafe for pedestrian use. The project is intended to mitigate impacts to the bridge prior to initiation of the Stage II drawdown of the Milltown Reservoir, currently scheduled for fall 2007. Impacts to the Interstate 90 and Highway 200 bridges must also be completed within this same time frame.

As previously discussed, the removal of existing bridge pilings and replacement of the Bonner Bridge with a new single span bridge without bridge pilings will coordinate with and substantially enhance natural resource restoration work planned by the State Restoration Plan.

7. **Recovery Period and Potential for Natural Recovery**

It is difficult to predict how long it might take for the natural resources in the Blackfoot and Clark Fork Rivers to recover naturally. However, if the existing pilings were not removed from

the river or the bridge was replaced or repaired with a new center pier, natural recovery in this reach of the river would be diminished or precluded for a period of time equal to the expected life expectancy of the bridge, or approximately 50 years. The proposed project would remove three pilings from the river channel, and two approach pilings from the fringe of the floodplain. The existing bridge would be replaced with a single span bridge with two low profile pilings to support approach spans on each river bank. These actions will significantly enhance the success of the restoration program for the river, and permit natural recovery to occur within the vicinity of the bridge consistent with the goals of the proposed restoration plan.

8. Applicable Policies, Rules and Laws

Permits and approvals required for this project will include a 310 permit from the local Conservation District, SPA 124 Permit from Fish, Wildlife and Parks, Floodplain Permit from Missoula County, Section 404 permit from the Corps of Engineers, 318 authorization from Montana DEQ, and a Navigable River Land Use License/Easement/Land Transfer Agreement from Montana Department of Natural Resources. These permits will be applied for through the Joint application for Proposed Work in Montana's Streams, Wetlands, Floodplains and other Water Bodies. Discussions have been initiated with Montana DNRC regarding the Navigable River Land Use Easement or potential land transfer to Missoula County. The project will involve the removal of a bridge built in 1921, and potentially considered to be a historic resource. Consultation with the State Historic Preservation Officer will be completed.

9. Resources of Special Interest to the Tribes and DOI

Although there are known Tribal cultural resources in the vicinity of the Milltown Reservoir, there are no known resources within the project area.

The Confederated Salish and Kootenai Tribes are trustees of natural resources within the project area as a result of rights associated with the 1855 Hellgate Treaty. The Tribes have been active partners in developing the Restoration Plan for the Clark Fork River and Blackfoot River near Milltown Dam – October 2005. As previously discussed in this application, this project is intended to enhance the Tribe's interest in restoring the rivers resources using natural design principles.

STAGE 2 GENERAL POLICY CRITERIA

10. Project Location

The Bonner Bridge is located over the Blackfoot arm of the Milltown Reservoir. The bridge is within the Milltown Reservoir area, as defined in the Upper Clark Fork River Basin Restoration Plan Procedures and Criteria (RPPC). The bridge is within the BFR1 reach of the Restoration Project Area of the State Restoration Plan. This river reach extends upstream to the location of the former Bonner Dam, adjacent to the Stimson mill. It is within the boundaries of the Milltown Reservoir Sediments NPL site, as designated by the U.S. Environmental Protection Agency.



Figure 15 Bonner Bridge Location

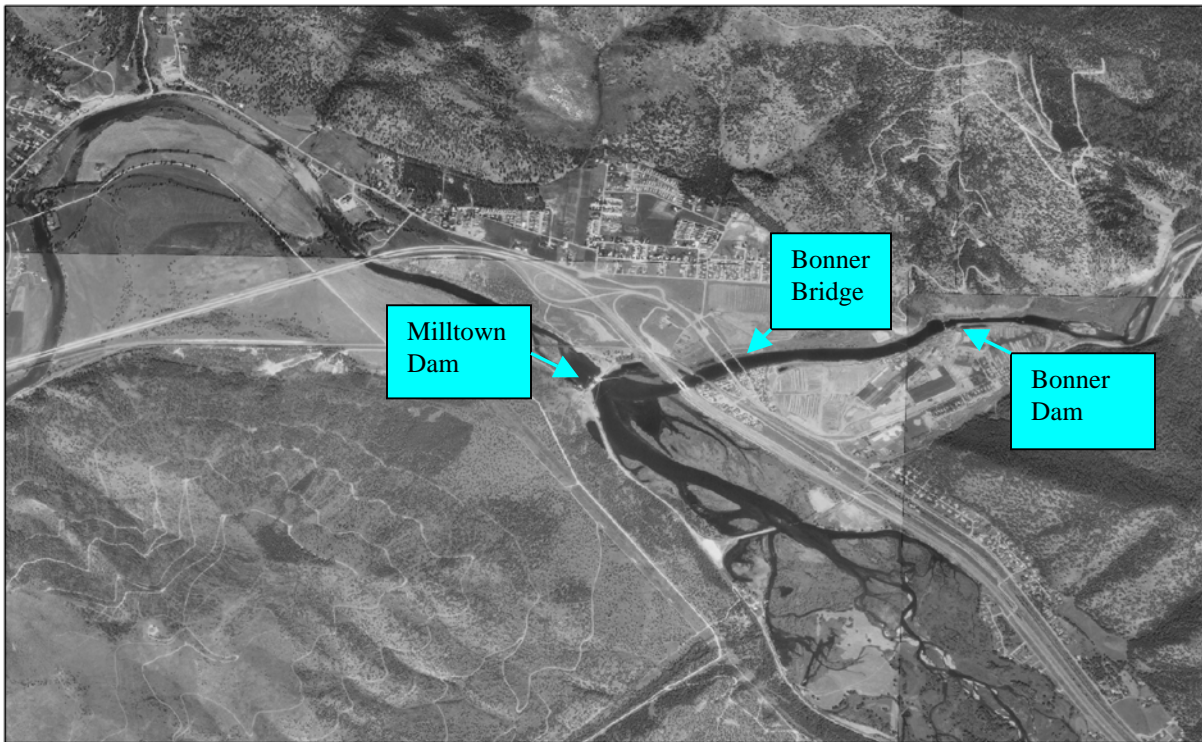


Figure 16 Bonner Bridge Location

11. Actual Restoration of Injured Resources

Injured resources within the project area include aquatic and riparian resources. These injured resources are located within the Milltown Reservoir Sediments National Priorities List site, where natural resources have been injured as a result of releases of hazardous substances by Arco or its predecessors that were the subject of *Montana v. Arco*.

The Bonner Pedestrian Bridge Project is designed to return injured resources and services provided thereby to baseline conditions or accelerate the natural recovery process. The project will result in the removal of three concrete piers from the center of the floodplain, and two approach piers from the floodplain fringe. The existing bridge will be replaced with a single span bridge with no center pier, and two low profile approach piers near each river bank. The project will allow the river to be restored consistent with the goals of the State Restoration Plan for the Clark Fork River and Blackfoot River near Milltown Dam – October 2005. The river's restoration can be accomplished without riprap or concrete structures that would confine the river in order to protect bridge piers. This will benefit aquatic and riparian habitat in the project vicinity and some distance upstream and downstream of the project area. Upland and streambanks within the County's 60 foot right of way will be restored and revegetated consistent with the goals of the Restoration Plan. Riparian habitat will be restored in coordination with Restoration work in this reach of the river.

12. Relationship between Service Loss and Service Restoration

A. Describe what services would be created or augmented by the proposal.

As a result of environmental injuries from mining and construction of the Milltown Dam, the Clark Fork and Blackfoot Rivers within the Milltown Reservoir Sediments Site have significantly degraded natural resources and provide very limited direct or indirect services to the public. Natural riparian habitats have been diminished. Riverine aquatic, wetland and riparian habitats have been eliminated by inundation in the reservoir and impacts of mining waste. Recreational use is extremely limited in the reservoir. Fishing, floating, birdwatching, walking and other forms of trail use are absent from most of the reservoir area.

B. Describe how the services that would be created or augmented by the proposal restore, rehabilitate, replace or represent the acquisition of equivalent services lost as a result of injury to the natural resource.

This project seeks to restore and rehabilitate the natural resources such that tangible and intangible assets are available to the public. First and foremost, the proposed restoration project will enhance recovery of natural habitat to support fish, wildlife and plants. When restored, the river corridor will be able to support services lost, such as fishing opportunities, wildlife viewing, and open space enjoyment. These public services or benefits, derived from the restored natural resources, are becoming increasingly important, particularly as access to alternatives is becoming more and more limited.

The recreational benefits derived through connection to the proposed trail and river access system will benefit public health. Opportunities to enjoy the outdoors are an important part of life in Montana, and the proposed project and coordinated trails and river access projects will replace an opportunity that was eliminated in the past due to the environmental damages. The health benefits of recreation are well documented, and the citizens of Milltown, Bonner, West Riverside and surrounding communities can look forward to receiving those benefits through their active use of the trail and river access system.

13. Public Support

Public support for this project and coordinated trail and river access projects has been strong. The Milltown Superfund Site Redevelopment Working Group proposed that the Bonner Bridge be repaired or replaced as part of its Redevelopment Plan for the Confluence of the Blackfoot and Clark Fork Rivers and surrounding communities, in January, 2005. Two public open houses were held in Bonner and Missoula to solicit public comments on the proposed redevelopment plans. More than 150 people attended each open house, and written comments were received. The trail and footbridge projects in the plan received very strong support from open house attendees, and were the most popular aspect of the proposed redevelopment plan.

The Redevelopment Working Group discussed options for repairing or replacing the bridge throughout the summer and fall, 2005. The Working Group represents a broad range of local residents, interest group and stakeholders in the local community and County at large. After much consideration, the group reached a consensus recommendation to replace the current bridge with a new, single span bridge. Although many members of the group were interested in preserving a community landmark, all agreed that the restoration of natural resources associated with the river should be the highest priority.

The Bonner School has been particularly strong in its support for replacing the bridge with a new bridge that will provide service to the community for the long term.

Letters of support for the project are attached.

14. Matching Funds and Cost Sharing

Missoula County proposes to provide matching funds in the amount of \$325,218, or 25% of total project costs.

15. Public Access

The project is intended to provide public access to the bridge, the connected trail system, river access sites and to the river itself. One of the primary goals of the County's redevelopment plan is for all lands within the Milltown Reservoir area to be transferred into public ownership and developed as a publicly owned park with associated trails, footbridges and river access facilities. The Bonner Bridge project is a critical component of this vision, providing the only safe access across the river in the resorted confluence and proposed interpretive center site and the communities of West Riverside and Pinegrove on the west side of the river, to Milltown, Bonner and recreational trail connections on the east side of the river.

Public access to the planned riverfront trail on the west bank of the river will be handicap accessible. The trail to the river confluence and proposed Interpretive Center is proposed to be hard-surfaces and handicap accessible.

16. Ecosystem Considerations

A. Explain how your project is sequenced properly from a large-scale, watershed management approach.

The Bonner Bridge Project schedule is sequenced to coordinate with remediation and restoration actions planned for the Milltown site. The project is made necessary by the removal of the Milltown Dam and resulting scour of bed sediments in the Blackfoot River. The removal of three piers from the location of the new river channel will contribute to the goals of the restoration plan, including goals for a naturally functioning river system, fish passage and recreational safety.

B. Indicate whether your project addresses multiple resources and if so, describe how.

As stated previously in this application, the project will benefit aquatic and riparian resources, and contribute to the development of recreational resources in the vicinity of the project area.

17. Coordination and Integration

Coordination with transportation and recreational trail, footbridge and park development projects is an important aspect of the project. Project scheduling and provision of alternate pedestrian access across the Blackfoot will require careful coordination with construction schedules and activities associated with the Highway 200 and Interstate 90 bridges.

Secondary benefits of the project include provision of transportation and recreation services for the local community and visitors. The project will maintain the baseline level of transportation service to the local community. As discussed earlier, the bridge will link to approximately five miles of new pedestrian trails planned by the County and Redevelopment Working Group for local residents of West Riverside, Pinegrove, Marshall Grade, Milltown, Piltzville and Bonner. These include residential areas that will be affected by construction traffic during the remediation of the Milltown Reservoir beginning in late 2006. The bridge will also provide a critical link to a recreational trail system planned by the Redevelopment Working Group and County for the area following remediation and dam removal. This plan includes construction of an additional 16 miles of recreation trail in the area and an additional footbridge located below the confluence of the two rivers and the current Milltown dam site, as originally proposed for federal transportation bill funding. The new trails would eventually link up with planned trails to be constructed in the second project phase, within the Milltown Reservoir remediation and restoration project area. These trails can not be constructed until remediation and restoration is complete, approximately five years from now. The trails would provide unique and exciting non-motorized recreation opportunities, linking to Missoula's riverfront trail system, the Bandmann Flats Golf Course, the Two Rivers Community Park, Turah Fishing access Site, Bonner School and Weigh Station Fishing Access Site. The Weigh Station Access Site would be improved with boat ramp, toilets, parking and vegetation planting. New river access sites would

be constructed near the Bonner Bridge and below the river confluence in the second phase of the project. The Bonner Bridge would provide a critical link to all of the resources, including access for local residents in Milltown and Bonner to new park, trail and river access facilities, and exciting loop trail opportunities linking to Missoula's Kim Williams Trail, the proposed interpretive center at the restored confluence, the Blackfoot River and upper Clark Fork River. Figure 5 shows the park, trail and visitor facilities proposed by the Milltown Superfund Site Redevelopment Working Group and Missoula County.

18. Normal Government Functions

Missoula County has no fund specifically for maintenance of pedestrian bridges. Statutorily speaking, the Missoula County Bridge Fund is to pay for vehicular bridges over natural streams. Routine maintenance of pedestrian bridges is paid for by the County General Fund. There are no funds available currently within Public Works Department budget or workplans that can pay for projects that involve removal or replacement of pedestrian bridges. Limited general fund money has been available for maintenance of the structure since it was given to Missoula County by the State. Missoula County does not have funds to replace the structure as part of normal government operation.

Step 6. Proposal Budget

A. BUDGET ESTIMATE Included at end of document for printed copies. Attached as excel files for electronic copies.

B. BUDGET NARRATIVE

Applicant – Missoula County

Project Title – Bonner Pedestrian Bridge

General Discussion of Spending Plan

The demolition and replacement of the Bonner Bridge would be completed through contracted services. The project will be competitively bid. Please see three-span bridge construction procedure in the technical narrative section of this proposal for a complete description of the project sequence and schedule.

Assumptions

1. Construction would occur after the first stage of the dam removal had drawdown the water surface elevations by approximately 10 feet.
2. Construction would be complete by the beginning of school year.
3. Piers still remaining in the river flood plain from the previous structure, would be removed.
4. Most of the work would occur during the first stage of dam removal but some clean up work could occur after final river/reservoir stage drawdown.

5. An additional 5 feet of depth of structure below predicted scour elevations was included as a safety margin.
6. Assumed structure life span would be 50 years. After repairs were made, maintenance for new bridges would be similar to maintenance for the existing bridge. No differential maintenance costs were included in the analysis.
7. Reseeding and regrading will be completed.
8. Walkway lighting would be included.
9. The existing structure would be completely removed along with any remnants of previous structures in the alignment.
10. Demolition and repair work would require the construction of a temporary work bridge adjacent to the existing structure.
11. New bridge horizontal alignment would be in the same alignment as the existing bridge but would be only 12 feet wide from the outside to the outside.
12. The bridge deck would be either durable wood or concrete. Concrete costs were used for costs estimates. The bridge superstructure would consist of weathering steel that would not require painting to maintain structural integrity.
13. The bridge would be of sufficient strength and width to allow cleaning, clearing, and repair vehicle access.
14. Substructure elements would be designed to provide minimum river flow restrictions and would not be affected adversely by riverbed scour. No future maintenance would be required for scour protection
15. Temporary pedestrian passage over the Blackfoot River will be provided by routing vehicle traffic to the southwest side of the bridge in two 12 foot traffic lanes, widening the existing pedestrian lane to 8 feet, and installing continuous jersey barriers to separate vehicle and pedestrian lanes. Jersey barriers would be pinned to the bridge deck. MDT will be consulted regarding potential vehicle speed restrictions.
16. Embankment stabilization is included, at a cost of \$40,000, based on the stability evaluation done for nearby Highway 200 bridge. EPA is paying for additional soil borings at the Bonner Bridge to help the County determine whether this will be required. Stabilization would likely be in the form of sheet piling at the base of the embankment, if necessary. This cost is included at this stage of planning as a conservative measure.

Sources of Cost Estimates

Cost estimates for the preferred alternative and other alternatives evaluated were provided by a number of sources, including the following:

1. Mobilization and re-mobilization. A cost estimate establishes the base line of the project cost at different stages of development of the project. A cost estimate at a given stage of project development represents a prediction provided by the cost engineer or estimator on the basis of available data. According to the American Association of Cost Engineers, cost engineering is

defined as that area of engineering practice where engineering judgment and experience are utilized in the application of scientific principles and techniques to the problem of cost estimation, cost control and profitability. Typically mobilization runs 5% to 7% of construction cost but will vary greatly depending on what the contractor has locally available and how far it needs to be relocated. Generally it is based on the Engineers judgment unless a detailed analysis is conducted.

2. Temporary Bridge – Frontier West LLC bridge construction experience including discussion regarding the size and extent of demolition and construction
3. Remove existing and erect new bridge – Frontier West bridge construction experience including discussion regarding the size and extent of demolition and construction
4. New Piers - Based on quantities of materials. Quantities of materials are based on engineering principles applied to bridge design. Unit prices for quantities are based on historical unit cost compiled by RS Means published by McGraw and Hill
5. New Bridge Sections – Roscoe Steel, Muth Engineering and Continental Bridge
6. Abutment Wing Walls - Based on quantities of materials. Quantities of materials are based on engineering principles applied to bridge design. Unit prices for quantities are based on historical unit cost compiled by RS Means published by McGraw and Hill.
7. Lighting – Cost for lighting of Madison Street Footbridge with energy efficient LED lighting system
8. Re-vegetation – Tom Parker, Geum Environmental Consulting

Bonner Bridge Revegetation Cost Estimate

				\$		
Upland Buffer Zone seed mix				150.00		
compost	10	cu. Yd.	15.00	per Cu. Yd.	150.00	
Contour Waddles	480	lin ft	3.00	per lin. Ft.	1,440.00	
Labor to apply compost, install contour wattles, and place woody debris (planting labor included in plant cost below)	40	hrs	45.00	per hr	1,800.00	* 1.5 days, 3 person labor crew
Woody Debris				200.00		
I Gal shrubs*	210		20.00	ea.	4,200.00	
I Gal Trees*	20		20.00	ea.	400.00	
maintenance (10% of total/yr for two years)				1,668.00		
				\$		
Total				10,008.00		

* incl. installation, browse protection, mulch

Contingencies

The project budget includes a 20% contingency, \$171,232. This contingency is appropriate for a project of this nature and at this stage of the project. The project costs are based on an assessment of anticipated construction approach and materials costs. The project will be competitively bid.

Contingencies are included in all engineers' cost estimates. Definition taken from National Academies Press : In discussions of risk, the term “contingency” is often understood to be a number added to an estimate for project costs or durations to cover some element of risk or uncertainty. Owners establish contingency levels for each project based on acceptable risk, degree of uncertainty, and the desired confidence levels for meeting baseline requirements. When used to absorb the impacts of project uncertainty, the contingency is a form of risk mitigation, and so in evaluating potential project contingency funding, owners should apply risk assessment and probabilistic estimating techniques. Contingencies are included to account for unknown and unforeseen costs that may be required but cannot be quantified at the current level of development. As details of a project are developed cost estimates contain lower levels of contingencies. The Bureau of Reclamation would use approximately 20 to 25% contingency at this stage of the project. The County will have greater certainty regarding costs and contingencies when the final engineered design plans and final engineer’s cost estimate are complete and ready to go to the construction contractor.

Appendix A
Letters of Support